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LIMPOPO BASIN CHALLENGE: WATER GOUVERNANCE (L4)

PRO-POOR MECHANISMS FOR WATER AND LAND ACCESS AND USES IN THE UPPER LIMPOPO BASIN, MOZAMBIQUE

Final report

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G-eau Gestion de l'Eau, Acteurs, Usages

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ABBREVIATIONS

AFRIDEV	A type of borehole, recommanded by DNA
AIDS / HIV	Human immunodeficiency virus infection / acquired immunodeficiency syndrome
AP	*Posto Administrativo* / Administrative Post
ARA-SUL	*Administração Regional de Águas do Sul* / Regional Water Authority for the South (of Mozambique)
CARITAS	Local branch of the CARITAS NGO, an NGO related to catholic church.
CBL	*Comité de Bacia do Limpopo* / Limpopo Catchment Committee
CFM	*Caminho de Ferro Moçambicano* / Mozambican Railways
CGIAR	Consultative Group on International Agricultural Research
CIP	*Centro de Integridade Publica*
CPWL	Challenge Program Water and Food
DNA	*Direção Nacional das Agua*s / National Directorate of Water
DPOPH	*Direção Provincial de Obras Públicas e Habitação* / Provincial Directorate for Public Work and Housing
DUAT	*Direito de Uso e Aproveitamento da Terra* / Land use right
FDD	*Fundo de Desenvolvimento Distrital* / District Development Fund
FEWSNET	Famine Early Warning Systems Network
FP	*Ponto Foca l* Focal Point
FRELIMO	*Frente de Liberação do Mozambique*, the political party in power in Mozambique
HICEP	Hidráulica do Chókwè, Empresa Publica / Chokwe Hydraulic public company managing the Chokwe irrigation scheme
INAS	*Instituto Nacional de Ação Social* / National Institute of Social Action
INGC	*Instituto Nacional de Gestão de Calamidades* / National Disasters Management Institute
IPCC	*Instituições de Participação e Consulta Comunitária* / Institutions for participation and community consultation
IWEGA	Internation Center for Water Econmics and Gouvernance in Africa
L4	Limpopo Basin Development Challenge Project 4 "Water Gouvernance"
LOLE	*Lei dos Orgões Locais do Estado* / Law of local bodies of the State
LUPA	*Associação para o Desenvolvimento Comunitario*, a mozambican NGO
LWF	Lutherian World Foundation
MICOA	*Ministerio para a Coordenação da Ação Ambiental* / Ministry for the Coordination of Environmental Affairs
MPOH	*Ministerio para as Obras Publicas e Habitação* / Ministery for Public Work and Housing
MT	Metical (plural meticais) Mozambican currency: 1USD = 30 MT aproximatively in 2013
NGO	Non Gouvernemental Organisation
OIIL	*Orçamento de Investimento de Iniciativa Local* / Local Initiative Investment Budget also called FDD
PARP	Plano de Acção para Redução da Pobreza /strategic plan for the reduction of

	poverty
PARPA	Plano de Acção para Redução da Pobreza Absoluta /strategic plan for the reduction of absolute poverty
PEC	*Participação e Educação Comunitária* / Participatory Community Education (name of the social dimension of water point development)
PEDD	*Plano Estratégico de Desenvolvimento Distrital* / Strategic Plan of District Development
PESOD	*Plano Económico e Social e Orçamento Distrital* / Economic and Social Plan and District Budget
PIA	*Pequena Infra-estrutura de Agua*
PNL	*Parque Nacional do Limpopo* - Limpopo National Park
PRONASAR	*Programa Nacional para Sanitação e Aguas Rurais /*
RBL	Regadio do Baixo Limpopo / Public company managing the Lower Limpopo irrigation scheme in Xai xai
SDAE	*Serviços Distritais de Actividades Económica*s / District Service of Economic Activities
SDPI	*Serviço Distrital de Planeamento e Infraestruturas* / District Service for Planning and Infrastructure
SWI	Small Water Infrastructure
SWS	Small Water System: small water infrastructure including a motorized pumping
UBGL	*Unidade de Bacia Do Limpopo / Unit for the Management of the Limpopo basin*
WASHCOST	a research project studying the real costs of water, sanitation and hygiene (WASH) sectors in rural and peri-urban areas in 4 countries including Mozambique
ZT	*Zona Tampão do Parque Nacional do Limpopo* / Buffer zone of the Limpopo National Park

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ABSTRACT

This study aims to examine the use and impact of pro-poor clauses in Mozambican public policies related to water in the Upper Limpopo Basin, from the case-study of the Mabalane district, a little populated and agro-pastoral district. In this semi-arid area water access is closely related to the issues of land access, infrastructure development, food security and resilience to extreme climatic events. Thus, different types of interventions (PRONASAR program, small-scale irrigation, social security interventions, relief operations to 2013 flood, allocation of the Local Development Funds, district planning process and role of consultative councils) were investigated through a public policy analysis approach carried out at district level and in 12 communities completed by a quantitative survey in 3 communities riverine to the Limpopo river using leaders' characterization of poverty.

Although local perception on equity favored blanket approach, results pointed out to a space for targeted interventions toward the most vulnerable. But the pro-poor interventions were insufficiently effective in reaching their target due to the gatekeeping role of village leadership and the ambiguities of some instruments. Although efforts is being made to better balance development, infrastructures and interventions were unequally spread in the territory because of projects implementation pathways and natural resources constraints. Salinity level for example impacted both use and maintenance of boreholes. In the local context, good leadership proved more important than committee "good practices" and formal (water or irrigation) committee functioning for small water infrastructures sustainability. The consultative councils could play a key role in adapting interventions to local specificities, blending the equity perceptions of politicians, technicians and population and better integrating SWI development and natural resources management in the planning process.

RESUMO

Esta investigação analisa o uso e impacto das cláusulas pro-pobres das políticas públicas moçambicanas relacionadas com a água na bacia do Alto Limpopo, a partir do estudo do distrito agro-pastoral de Mabalane. Nesta zona semiárida, o acesso à água está intimamente relacionado às questões de acesso à terra, de desenvolvimento de infra-estruturas, segurança alimentar e resiliência aos eventos climáticos extremos. Diferentes tipos de intervenções (Programa PRONASAR para água e saneamento, irrigação de pequena escala, mecanismos de segurança social para os mais pobres, respostas às cheias de 2013, alocação do Fundo de Desenvolvimento Distrital como suporte ao projectos de geração de renda, processo distrital de planeamento e papéis dos conselhos consultivos) foram investigados usando uma abordagem de análise de políticas públicas desenvolvida a nível do distrito e de 12 comunidades. Essa abordagem foi completada por um estudo quantitativo em 3 comunidades ribeirinhas do Rio Limpopo, baseado na caracterização da pobreza pelos líderes das aldeias.

Enquanto percepções locais sobre equidade favorecem abordagens uniformes a nível das comunidades, os resultados indicam que existe espaço para intervenções direccionadas aos mais

vulneráveis. No entanto, no momento, as intervenções pro-pobres têm uma eficiência limitada, para atingir o seu alvo devido ao papel de guardião das lideranças locais e das ambiguidades de certos instrumentos. Mesmo se o governo distrital se esforçe para promover um desenvolvimento territorial equilibrado, infra-estruturas e intervenções permanecem desigualmente distribuídas no território. Isso é explicado pelas trajectórias de implementação dos projectos e pelas limitações dos recursos naturais. A salinidade por exemplo, tem impacto tanto para o uso da água, como para a manutenção dos furos. No contexto local, a boa liderança aparece/é mais importante que o funcionamento formal e do que boas práticas dos comités (de água/irrigação), para a sustentabilidade das pequenas infra-estruturas de água (PIA). Os conselhos consultivos poderiam ter um papel maior na adaptação das intervenções às especifidades locais, na integração das percepções sobre equidade dos políticos, técnicos e da população e para melhor integrar o desenvolvimento das pequenas infra-estruturas com a gestão dos recursos naturais, no processo de planeamento.

Com a adopção do Plano de Acção para Redução da Pobreza Absoluta (PARPA I) e suas continuações, o Governo de Moçambique oficializa seu foco de atenção no alívio à pobreza. O objectivo da investigação é analisar o uso e impacto, das cláusulas de apoio aos pobres das políticas públicas moçambicanas relacionadas à água na bacia do Alto Limpopo em Moçambique. Nesta zona semi-árida, o acesso a água está intimamente relacionado à questões de acesso a terra, desenvolvimento de infra-estruturas, segurança alimentar e resiliência aos desastres climáticos (seca e cheia). Foram investigados cinco principais instrumentos ou processos: (i) Desenvolvimento de pequenas infra-estruturas de água, especificamente a melhoria da fonte de água doméstica através do PRONASAR e desenvolvimento de irrigação de pequena escala (ii) Intervenções de segurança social para os pobres mais necessitados principalmente, os subsídios aos agregados familiares contemplados e o programa de segurança alimentar do INAS (iii) a reacção às cheias de 2013 (iv) o Fundo de Desenvolvimento Local para o suporte de projectos de geração de renda (*Orçamento de Investimento de Iniciativa Local)* (v) o processo de planeamento local e o papel dos Conselhos Consultivos na implementação e coordenação destas intervenções.

O estudo foi realizado no distrito de Mabalane, um dos cinco distritos da Província de Gaza que se encontram dentro da zona semi-árida da bacia do Alto Limpopo Limpopo, um distrito pouco populoso e de elevado potencial agro-pecuário. Abordou-se o trabalho em três passos: (i) De início, o quadro institucional foi caracterizado através de revisão de literatura e entrevista as pessoas-chave a nível nacional (ii) A implementação de principais políticas relacionadas a vulnerabilidade e água foi investigada usando a abordagem de análise de políticas públicas através de entrevistas as pessoas-chave locais e de análises qualitativas do uso, acesso e gestão de água em doze comunidades (iii) Por fim, perspectivas de equidade e gestão de água ao nível de comunidade foram investigadas com uma amostra de 119 agregados familiares em três aldeias ribeirinhas. Em cada aldeia, o líder foi encarregado de ordenar os agregados em 4 grupos de riqueza (Muito Pobre, Pobre, Medio, Pouco Pobre) e vinte porcento de cada grupo foi aleatoriamente seleccionado para ser entrevistado.

CARACTERIZAÇÃO DA POBREZA

Mabalane não é o distrito mais pobre dos que estam na bacia do Limpopo, contudo encontra-se no quarto quartil dos distritos mais pobres de Moçambique de acordo com a classificação oficial baseada em indicadores de nutrição, segurança alimentar e de acesso aos serviços públicos. Acesso a água e factor chave de pobreza: Em Moçambique os mais pobres recebem o pior serviço em termos de acessibilidade e quantidade, o que agrava a situação deles de pobreza (Zita et al. 2012).

Segundo a classificação do líder local, os dois grupos de renda mais baixa no nosso estudo (*Mais pobre e Pobre*) representaram dois terços da amostra (21% e 42% respectivamente). Nesta área altamente susceptível à seca, a classificação de pobreza por parte dos líderes baseou-se no papel dos capitais tais como equipamento de lavoura, mão-de-obra e rendas de origens não agrárias (remessas, negócio local e produção de carvão). O excedente da renda é investido em bovinos e algumas melhorias da casa. Contudo, o número médio de 20 cabeças de gado bovino para os agregados familiares menos pobres ("menos pobres") indica uma acumulação limitada de riqueza. As diferenças significativas entre os grupos de baixa renda (Mais Pobre, Pobre) e os de

elevada renda (Médio e Menos Pobre) se encontraram unicamente em mão-de-obra a nível familiar, aves (galináceos) e cabeças de gado bovino.

De acordo com esta classificação, pobreza é a condição que limita a habilidade do agregado familiar de fazer uso das oportunidades que são oferecidas pelo ambiente. No meio rural e distritos distantes como Mabalane, oportunidades estão predominantemente relacionadas ao acesso aos recursos naturais, que nesta zona semi-árida são: os terraços aluviais que permitem as culturas produtivas de recessão ocasionalmente ou a agricultura de sequeiro pouca confiável; as terras arenosas nos lacais mais altos que só permitem uma agricultura de sequeiro muito aleatória; A floresta de Mopane e a sua biodiversidade (fauna e flora) e produtos madeireiros associados; os recursos em água seja águas superficiais do rio Limpopo e água (salina) do subsolo.

Porém, estes recursos estão desigualmente distribuídos no território e os serviços providenciados pelos ecossistemas variam dentro do território distrital. A distribuição espacial dos serviços ecosistémicos é tanto mais importante quanto as infra-estruturas limitadas, o capital disponível e quadro institucional tais como o regulamento do Parque Nacional do Limpopo (PNL) restringem o acesso e uso destes recursos pelos agregados familiares num distrito como Mabalane do que pobres. Além de mais, emprego ou oportunidades económicas relacionadas ao mercado, são quase que inexistentes ou extremamente localizadas.

De facto, há indicações que o nível de pobreza varia entre as quatro principais áreas identificadas, notavelmente entre (a) as aldeias ribeirinhas da margem direita do rio Limpopo que têm acesso aos terraços aluviais e recursos de água mas áreas florestais e de pastagem limitadas (b) as aldeias de *Plateau* sem acesso a águas do rio mas com grandes áreas de floresta e de pastagem e (c) as aldeias ribeirinhas da margem esquerda do rio Limpopo que estão afectadas pela regulamentação do PNL. Acessibilidade e distância até os mercados principais e centros administrativos também estruturam estruturas o território. Como as informações disponíveis são agregados por postos administrativos e não por ecossistema, dados faltam para melhor quantificar o impacto destas diferenças. Contudo, foi evidenciada uma desigualdade clara de acesso a água doméstica antes a intervenção do PRONASAR: as aldeias ribeirinhas do Limpopo estavam melhor equipadas do que outras aldeias, especialmente as situadas na parte sul do distrito (mais próximo a estrada asfaltada) ou as do arredor de Mabalane-Sede.

O termo geral de pobreza em Ronga/Changana enfatiza o atributo duplo de pobreza material e isolamento social (Tvedten et al. 2010). Enquanto a posição de liderança foi sempre encontrado nos grupos de alta renda, interessantemente as outras responsabilidades (tais como conselheiros, membros do partido ou médicos tradicionais) foram encontrados também nos grupos de baixa renda. Isto indica que outro critério para além de riqueza preside o envolvimento na vida da comunidade e/ou os agregados familiares mais pobres podem não ter as habilidades ou as oportunidades para melhor se beneficiar das oportunidades oferecidas pelas suas posições assim como os agregados familiares mais ricos.

Como foi notado em outros estudos, a ajuda mútua, interligava grupos de diferente nível de riqueza a nas comunidades. Possibilita os agregados familiares a colmatar a ocasional falta de mão-de-obra, através da troca ou retribuição de produtos. A participação em forma de ajuda mútua ocasional (principalmente *Matsimu* – trabalho realizado ocasionalmente, para remoção de infestantes para receber em troca produtos – como por exemplo bebidas alcoólicas – e *Kurimela/Kurrimelissa,* trabalho na machamba de outro para em troca receber dinheiro) aumenta nos grupos de menor riqueza. Enquanto dois terços dos agregados familiares são envolvidos em troca de ajuda mútua ocasional apenas 35% dos entrevistados recorreram a intercâmbios regulares principalmente *Kukashela / kukashelissa* que é a troca de dias de trabalho contra equipamentos de lavoura, que é a principal forma pela qual machambas dos

mais pobres são lavradas. Mas esses mecanismos ainda são pouco eficazes para os mais vulneráveis: eles são os menos capazes de retribuir, devido à sua limitada disponibilidade em mão de obra e as restrições das trocas monetárias nessas aldeias poucas monetizadas.

LIDAR COM A POBREZA À NÍVEL DA COMUNIDADE

A EFICÁCIA LIMITADA DAS INTERVENÇÕES DE APOIO AOS POBRES AO NÍVEL DAS COMUNIDADES

No papel, apenas dois tipos de intervenções explicitamente tem como alvo os mais vulneráveis nomeadamente, os programas do INAS e as operações de alivio em resposta a seca / cheias, os quais têm alcance limitado no tempo e / ou espaço.

Embora o número de pessoas abrangidas pelos subsídios INAS ou as intervenções de segurança alimentar tenha aumentado nos últimos anos para atingir 13% dos agregados familiares do distrito, apenas oito das 43 aldeias/comunidades estão contempladas; Famílias de todos os grupos de riqueza mencionaram ter beneficiado destes programas, mas a percentagem dos beneficiários aumentou consoante o baixo nível de renda dos grupos.

A pobreza e a vulnerabilidade ao risco estão ligados e os riscos de inundação são desigualmente imposto sobre as famílias: as famílias mais pobres, os com menos equipamentos foram os que reportaram a perda mais importante do equipamento embora possuem menos equipamentos. No entanto, a percepção das cheias é globalmente positiva principalmente porque estas aumentam a fertilidade do solo e permite o desenvolvimento em extensas áreas das culturas de recessão que são produtivas: na verdade, 2013 foi considerado como o melhor ano agrícola na última década. Mesmo assim as primeiras semanas após as cheias foram uma época difícil porque as águas destruíram a primeira colheita muito procurada nesta período de fome e o replantio é necessariamente limitado pela disponibilidade de sementes.

Foram implementados dois tipos de intervenções: A ONG "*Save the Children*" subsidiou a compra de insumos agrícolas e pequenos equipamentos por meio de senhas no valor de 1500 MT distribuídas para 2000 beneficiários das 37 comunidades ribeirinhas. Beneficiários considerados como o "mais vulneráveis" e "mais afectados pela inundação" deviam ser directamente seleccionados pela ONG nas aldeias. Na prática, esta selecção foi deixada à responsabilidade dos líderes da aldeia, devido à falta de tempo e meios de transporte para visitar as aldeias. Os líderes também desempenham um papel fundamental no circuito administrativo normal de selecção, utilizado na distribuição do pacote de ajuda do Governo. A alocação de sementes do Governo foi deixada ao critério dos serviços técnicos distritais: Se mais de metade das sementes foram alocados para localidades (unidade local administrativa) para distribuída para os agricultores de subsistência, a quantidade recebida pelas famílias foi insignificante (menos de 0,5 kg). Um terço da alocação foi dividido entre técnicos, agricultores "emergentes" e associações de irrigação.

Ao nível da aldeia, responsabilidade na aldeia ou filiação partidária aumenta a possibilidade de beneficiar-se das intervenções do governo, mesmo se famílias mais pobres podem também se beneficiar deste tipo de apoio. A proporção de famílias mais pobres beneficiadas aumenta nas intervenções que explicitamente se dirigem aos mais vulneráveis. Globalmente, famílias de

renda mais elevadas tendem a receber mais apoio do governo, enquanto as senhas da ONG beneficiou igualmente a todos grupos de riqueza, mas não necessariamente mais para o mais pobre. Assim intervenções direccionadas ajudam a corrigir os defeitos / falhas do circuito de distribuição administrativa, mas não evita os processos de captação pelas elites. Em qualquer caso, a proporção de agregados familiares mais ricos atingida pela intervenção variou nas três aldeias, o que chama atenção para o papel do guardião e "bloqueio" por parte da liderança a nível das comunidades.

O PAPEL DE "BLOQUEIO/ GUARDIÃ" DA LIDERANÇA COMUNITÁRIA

Há arranjos bastante complexos entre os líderes herdada (tradicionais), líderes eleitos, bem como, conselheiros dos respectivos líderes e comissão "*ad-hoc*" criado por intervenção externa. Como o líder de 2° escalão (eleito) é o representante oficial entre a comunidade e o mundo externo, este líder tem um papel fundamental na disseminação de informação e comunicação na aldeia. Enquanto alguns líderes são responsáveis perante a sua comunidade e confiável, muitos actuam como "bloqueadores" ou guardiões e geram baixa confiança ou desconfiança. As informações de projecto ou programa muita das vezes não circula fora do primeiro círculo do(s) líder(es) onde os conselheiros de comité "ad'hoc" são geralmente seleccionados. Operações que têm potencial económico directo em comparação com as intervenções de serviços públicos estão particularmente em risco. Nessa razão, a estratégia de entrada das intervenções externas e as suas trajectórias de implementação desempenham um papel fundamental na manutenção da coesão e confiança comunitária. Quaisquer tensões preexistentes são ampliadas por intervenção externa pouca transparente ou responsável e contribui para minar o capital de confiança da comunidade.

AS AMBIGUIDADES DOS PROJECTOS DE FDD

O Fundo de Desenvolvimento Distrital, que permite o desenvolvimento de projectos de geração de renda é apresentado como um mecanismo de redução da pobreza. Nos últimos 3 anos de sua implementação no Distrito de Mabalane financiou 141 projectos. Como em todo Moçambique, a taxa de reembolso ainda permanece baixo (sendo 10% do montante devido pago até agora em Mabalane), mas a pressão para o reembolso tem vindo a aumentar no último ano no distrito com algum (limitado) impacto. Há um interesse crescente de criação de animais talvez seja porque a dívida pode ser facilmente reembolsada pela prole.

Os conselhos distritais desempenham um papel importante na alocação de FDD e avaliação da confiabilidade do promotor do projecto. Parece haver pouca concorrência localmente entre os projectos, excepto nas principais vilas: o posto administrativo mais rural até mesmo reportou a dificuldade para alocar integralmente a sua parte. O excesso está a ser revertido ao nível distrital, que beneficia principalmente área de Mabalane-Sede que concentra o maior número de funcionários públicos e elites locais. Na verdade, como apontado pela monitoria do Centro de Integridade Publica em Mabalane e outros distritos, as elites do distrito, como empresários e funcionários públicos são os que mais se beneficiam do fundo. Assim, em Mabalane, a maioria dos beneficiários de aldeias vêm das mesmas comunidade e apenas dois agregados familiares da nossa amostra tive um projecto financiado pelo FDD.

O principal problema é que este tipo de projecto e financiamento não são capazes de responder às necessidades dos pobres, por várias razões. Eles não têm mecanismos para lidar com os riscos importantes (seca, morte do chefe de família etc) que podem descarrilar mesmo o beneficiário mais confiável e trabalhador: Esses agregados familiares que têm recursos limitados estão em uma situação muito difícil para compensar qualquer perda inesperada. Além do mais, o contexto local da aldeia é caracterizado por riscos climáticos importantes, uma monetarização limitada e oportunidades de mercado muito estreitas, o movimento do mercado sendo mesmo restrito ao nível da sede do distrito. Neste contexto a maioria das actividades só pode marginalmente fornecer um excedente para aumentar a renda e disponibilidade de alimentos e ao mesmo tempo pagar o empréstimo do fundo. Além disso, poucas actividades podem fornecer base significativa de emprego. Por exemplo, um sistema de irrigação 4/5 há recorre principalmente em força de trabalho familiar. Para ser bem-sucedidas, muitas pessoas pobres precisam também de apoio técnico de longo prazo na implementação do seu projecto: Mesmo as actividades mais adaptadas para o alívio a pobreza, tais como projecto orientados na criação de pequenos animais como pequenos ruminantes ou aves, deve ser ligado ao apoio veterinário adequado. Contudo, os serviços técnicos priorizam ao apoio aos agricultores emergentes. Portanto, o papel dos projectos de FDD na redução da pobreza a nível das aldeias é discutível.

Implicitamente este tipo de mecanismo assume que a pobreza é exclusivamente originada por falta de acesso a recursos (em particular financeiros) e os bens materiais. Mas, excepto para os mais pobres, a pobreza não só derivada da escassez de activos (inclusive financeiros), mas da capacidade limitada de se aproveitar das oportunidades existentes em função das restrições de capital social e político. Consequentemente, não é surpreendente que os fundos do FDD tem no momento um impacto directo ou indirecto muito limitado para os pobres das comunidades.

A PERCEPÇÃO SOBRE EQUIDADE FAVORECE UMA ABORDAGEM GENERALIZADA A TODAS FAMÍLIAS, MAS HÁ ESPAÇO PARA A INTERVENÇÃO DIRIGIDA AOS MAIS VULNERÁVEIS

Dois exercícios foram realizados para avaliar as perspectivas locais sobre equidade. No primeiro, os entrevistados foram convidados a escolher uma carta entre quatro opções propondo diferentes abordagens para distribuir um esquema de emergência com base em senhas subsidiadas. No segundo, os entrevistados foram convidados a escolher suas três opções de desenvolvimento favoritas e três menos favoritos em um pacote de 18 opções.

Contrariamente aos técnicos que preferem favorecer as pessoas que são mais capazes de tirar proveito do apoio prestado, por exemplo, agregado familiar com nível de recursos mais elevados, os residentes globalmente favorecem abordagens gerais (intervenção que atinge todas as famílias da aldeia) ou opções de desenvolvimento que beneficiam a comunidade como um todo, tais como serviços ou equipamentos públicos. Eles tendem a rejeitar as intervenções que beneficiam um número muito pequeno de pessoas ou poderiam ser controladas por poucas famílias, pois gera inveja e conflitos internos na aldeia. Isto inclui esquema de demonstração de nova tecnologia (tipo demonstração agrícola ou tanque cisterna etc) que é percebido como um favor para os beneficiários. Salientaram a importância de opções ou arranjos que podem aumentar a coesão e confiança e / ou limita a emergência de desconfiança e inveja na aldeia. Criação (cabra ou gado) foi mais valorizada pelo seu potencial a segurança alimentar do que a irrigação. Opções que minimizam a mobilização de trabalho ou a sua demanda também foram levadas a atenção.

Após a abordagem de tipo “geral”, a segunda melhor opção foi a intervenção direccionada a um grupo vulnerável específico. Foi inclusivo a primeira escolha para os residentes de grupos médios de riqueza. Na verdade, o nosso estudo trouxe à luz existentes mecanismos de apoio aos pobres ao nível da comunidade, tais como tarifas de água especiais para as famílias mais carenciadas. No entanto, nem estas tarifas a favor dos pobres, nem os critérios para acessá-las parecia estar bem compartilhadas. Em conclusão, intervenções direccionadas podem ser aceitável desde que a aldeia esteja envolvida na definição dos critérios de selecção e que seja realizado um controle a posterior de beneficiários para garantir transparência.

REEQUILIBRAR O ACESSO À ÁGUA NO TERRITÓRIO DISTRITAL

A SALINIDADE DA ÁGUA COMO UMA QUESTÃO-CHAVE PARA O USO E ACESSO A LONGO PRAZO

Com 30 novos furos e 9 reabilitações realizadas entre 2011 e 2012, o programa PRONASAR de facto, aumentou (em 52%) o número de pontos de água funcionais no distrito, um resultado significativo neste distrito com falta de água. No entanto, acesso à água (domestica) continua a ser uma preocupação fundamental para a maioria dos entrevistados, mesmo que eles pertençam a comunidades com furos PRONASAR. Não houver consenso sobre o melhor tipo de pequena sistema de água (PSA) (furos / pequeno sistema de água) e na aceitação de furo de água salina. Curiosamente duas palavras diferentes foram usados em língua vernacular para caracterizar salinidade da água (um traduzido em salobra e o outro como amargo) uma diferença que precisa ser investigada.

Na amostra em estudo, cada pessoa usou em média 18,9 litros de água por dia, sem diferença estatística entre os grupos de riqueza. Este valor corresponde a um "serviço de qualidade abaixo da norma", um pouco abaixo da norma básica de serviço (acima de 20 l/dia por pessoa) (Zita anda l 2012). A zona de "conforto" em termo de numero de habitante por furo esta abaixo do nível 300 retidos pelo governo e se aproximou de 100 famílias / ponto ou abaixo. Por causa da salinidade da água subterrânea, algumas famílias principalmente as com transporte e disponibilidade de trabalho ainda continuam a usar a água do rio, apesar de reconhecer a sua menor qualidade higiénica. Existe também alguns sistemas de colecta de chuva individual de pequena porte usada unicamente durante o período chuvoso.

Neste ambiente desafiador, seria interessante explorar mais sistematicamente as vantagens comparativas de outro tipo de infra-estrutura de abastecimento, tais como os pequenos sistemas de bombeamento de água do rio ou pequenos reservatórios, em termos de qualidade, investimento e custo operacional. Como apontado pelos técnicos distritais, esta última opção e provavelmente a única solução sustentável na área alta do distrito. Mas essas opções têm suas próprias restrições que devem ser investigadas e debatidas abertamente com a população. Em reservatórios de uso múltiplo, seria necessário fazer tratamento específico de água com consequências sobre a complexidade de gerenciamento e os custos operacionais e, consequentemente, as tarifas. Bombeamento também aumenta o custo de gerenciamento que pode ser um factor limitante, como sublinhado por dificuldades de pequeno abastecimento de água existente em algumas aldeias. Equipamento de bombagem também pode ser vulnerável a riscos de cheias e secas.

OS FACTORES DETERMINANTES DO DESENVOLVIMENTO ESPACIAL: IMPLEMENTAÇÃO DE PROJECTO E LIMITAÇÕES HIDROGEOLÓGICAS

É justo dizer que o Governo do Distrito tem-se esforçado nos últimos anos para promover um desenvolvimento espacial mais equilibrado, por exemplo, incentivando ONG ou intervenções externas para intervir nas áreas subdesenvolvidas nomeadamente na zona de tampão do PNL ou áreas altas. No entanto, essa estratégia enfrenta limites no caso de acesso à água por causa da heterogeneidade hidrogeológica do distrito como sublinhada pelas dificuldades encontradas na implementação do programa PRONASAR.

Inicialmente, o governo distrital tinha atribuído um número igual de furos em cada posto administrativo que foram alocados para as aldeias pelos conselhos consultivos. Mas em alguma área, revelou-se difícil encontrar local com nível de salinidade abaixo do limiar que foi escolhido em 5000 µS/cm localmente (enquanto a norma nacional esta de 2500 µS/cm). Como o contracto se aproximava ao fim, técnicos e governo distrital decidiram se concentrar na área de planalto do posto administrativo de Combomune, onde se tinha sido provado mais fácil encontrar locais de perfuração adequada. Como resultado, a desigualdade espacial inicial em termos de acesso à água foi parcialmente corrigida mas as aldeias situadas na zona tampão permaneceram menos merecidas que outras áreas (área ribeirinhas e planalto).

No passado abordagem de desenvolvimento baseada em projecto de prazos relativamente curtos, os mecanismos de interferência política e / ou a pressão de "cima para baixo" para prestação de contas baseada em indicadores quantitativos têm aumentado a diferenciação espacial da pobreza: áreas com acesso mais fácil ou mais chance de sucesso, tinha mais chance de ser atingidas pelas intervenções que outras áreas. Como em outros países africanos (Booth e Cammack 2013b) o funcionamento dos serviços estaduais ainda esta moldada pela ajuda externa e as interferência políticas. A interacção entre esses mecanismos tendem a alimentar o círculo vicioso de investimentos em algumas comunidades, em detrimento de outras. Contribui também para enfraquecer a conformação as regras pelos funcionários públicos no contexto de "bolsa" do neo-patrimonialismo[1] onde o controle dos recursos do Estado e o uso do poder político permite perpetuar as relações de clientelismo.

Os indicadores de eficiência exclusivamente baseados em resultados concretos do programa / projecto, como número de furos não dão a devida importância para a qualidade do processo de implementação, que desempenha um papel importante na sustentabilidade das intervenções. Existe, portanto, a necessidade de ampliar o conjunto de indicadores a ser utilizada na monitoria e fiscalização de projecto, programa, a fim de melhorar a qualidade da execução. Por exemplo, o programa como PRONASAR poderia se referir ao número de referência ao projecto nas actas de reunião dos Conselhos Consultivos, no número de transcrição nas cadernetas de furo ou no número de agricultores efectivamente envolvidos na irrigação por cada motobomba.

APOIO À DESCENTRALIZAÇÃO: AINDA MUITO CAMINHO A PERCORRER

1 Neo-patrionalismo é o sistema pelo qual os patrões utilizam os recursos estatais para garantir a fidelidade dos seus clientes no público em geral. Em outras palavras, sistema onde oficiais ocupam postos burocráticos menos para garantir acesso as bens e serviços públicos do que para adquirir riqueza e estatuto pessoal.

A intervenção PRONASAR tinha explicitamente o objectivo de apoiar os processos de descentralização em curso das instituições moçambicanas. Foi realizado encarregando o nível provincial da gestão do programa, na excepção do desenvolvimento do pequeno sistema de água para Mabalane-Sede que foi gerida directamente a nível central. Mas na prática, os mecanismos utilizados enquanto reforça-se o papel da administração e serviços técnicos provincial, contribuiu para enfraquecer parcialmente os serviços técnicos distritais.

Enquanto foi claro que tive capacitação e aprendizagem de mecanismos administrativos a nível provincial, para a maioria dos agentes do Estado, os objectivos do programa se limitam às suas dimensões burocráticas ou administrativas, tais como o fornecimento de equipamentos de trabalho e recursos para a administração. Embora as equipes distritais têm sido quase sempre envolvidas no monitoramento e acompanhamento do trabalho dos contratantes, o fornecimento de indicadores, informações ou dados eram percebidos como uma exigência do nível Provincial (ou Nacional), e não como uma base para trabalho diário e / ou tomada de decisão do nível distrital. É notável, por exemplo, que nenhum dos numerosos indicadores colectados em comunidades pelo contratante PEC estava disponível a nível distrital e, quando disponível eles incluíam erros. O funcionamento do programa parece ter reforçado os laços de dependência dos serviços técnicos distritais com o nível Provincial. O funcionamento hierárquico e a pressão de cima para baixo não são de modo algum negativos em se por ser necessário para disciplinar funcionários públicos, limitar os processos de captura da ajuda pelos agentes do estados e promover impacto no terreno. No entanto, deve deixar espaço para os processos de coordenação e elaboração de arranjos locais que se adequam a local situação. Em Mabalane, os processos de coordenação e interacções de trabalho entre os serviços técnicos distritais poderiam claramente ser melhoradas. Além disso, ideias inovadoras para se adaptar às situações e desafios locais, como o patrocínio de armazenamento de peças sobressalentes para furos através de projecto FDD foram paralisadas e, as vezes, nem mesmo levado ao conhecimento do nível provincial ou nacional.

Além disso, os Conselhos Consultivos foram subutilizados durante a intervenção do PRONASAR. Por lei, são envolvidos nos processos de planificação distrital e selecção de projectos de FDD. Apesar de claramente ser controlado pela administração e o partido, essas instituições estão em pleno funcionamento: Eles se encontram em uma base regular e actas das reuniões estão disponíveis, e estas actas ocasionalmente reportam dissidência sobre o funcionamento de serviços ou reclamações. Mas também apontam que, assim como o comité de bacia hidrográfica, eles são usados muito mais como uma arena de transmissão de informação que como um órgão consultivo, excepto para a atribuição de FDD na qual os conselhos desempenham um verdadeiro papel indicativo.

O programa PRONASAR foi de facto apresentado aos Conselhos Consultivos em seu início (pelo menos a nível distrital e posteriores) como comprovados nas actas, mas houve depois poucas referências ao seu desenvolvimento ou problemas encontrados nas actas posteriores excepto referências aos atrasos no desenvolvimento do pequeno sistema de água de Mabalane-Sede. Uma melhor utilização desses conselhos durante as fases de elaboração e implementação de projecto ajudaria provavelmente, a adaptá-lo às especificidades locais do distrito. Em qualquer caso, ele teria contribuído para trazer a luz as perspectivas dos habitantes locais e seus conhecimentos locais (sobre salinidade, equidade, etc.). Como o lugar onde diferentes racionalidades e perspectivas sobre equidade (de políticos, técnicos e comunidade) pode ser confrontado, debatido e misturado, Conselhos Consultivos deveriam prestar um papel mais importante na alocação de recursos nos processos de planeamento ao nível dos distritos, postos administrativos e localidades, bem como na elaboração e moldagem de soluções adaptadas localmente.

NO CONTEXTO LOCAL, UMA BOA LIDERANÇA É MAIS IMPORTANTE QUE O FUNCIONAMENTO NORMATIVO DOS COMITÉS DE ÁGUA PARA A SUSTENTABILIDADE DAS PEQUENAS INFRA-ESTRUTURAS DE ÁGUA

PRONASAR colocou uma forte ênfase na reestruturação do modelo de manutenção. Com oficialmente 25% dos poços não-funcionais (20% é a média nacional) a manutenção aparece como uma questão relevante para o acesso à água em Mabalane.

Uma análise histórica do funcionamento dos furos e de suas manutenções revela que o acesso a peças sobressalente ou capacidade técnica não é o principal factor limitante à reparação dos furos na área, excepto para casos muitos específicos (por exemplo, um modelo especifico de furo não esta mais comercializado no Moçambique e consequentemente não existe peças sobressalentes a nível nacional). Por isso, é provável que o desenvolvimento de uma cadeia de fornecedores locais como previsto pelo PRONASAR, não vai tanto reduzir a percentagem de furos não-reparados (abandonados) do que o tempo de reparação.

Dinheiro parece, assim, ser mais limitante do que a disponibilidade de peças sobressalentes. A pesquisa não aponta em direcção a problema de transparência, com 87% das pessoas declarando ser informadas do uso de dinheiro e 84% aprovando este. No entanto, o programa dá uma atenção especial à estruturação dos comités de água sob o pressuposto que preencher a totalidade dos postos do comité reduz o risco de má gestão de dinheiro. De acordo com a inspecção de um caderneta de água e desta pesquisa, entre 55 ou 60% dos residentes estão com pagamentos de tarifa de água em dia. Famílias mais pobres são proporcionalmente muito mais atrasadas do que as outras famílias que enfatiza a necessidade de "tarifas sociais de água". Esses tipos de tarifas foram introduzidos em algumas aldeias pelas ONGs que implementaram os primeiros furos nos anos 90, mas apesar de estar prevista no programa PRONASAR esta possibilidade nunca foi discutida com a população. Na verdade, nenhuma das cláusulas de apoio aos pobres do programa foram explicitamente implementadas: nenhum técnico mencionou qualquer formação sobre esta dimensão, ao contrário por exemplo, dos aspectos de género.

Nesta base, o dinheiro facilmente disponível a nível das aldeias para manutenção do furo varia entre 5000-12000 MT, dependendo do número de usuários por furo. Consequentemente um limiar de 10000-12000 MT para a intervenção do Estado pode ser recomendado e uma soma correspondente incluído no orçamento anual do SDPI para permitir a reabilitação ou reparação fora do alcance dos aldeões.

A responsabilidade comunitária para a gestão e manutenção do pequenos sistema de água (PSA) não esta questionada e a manutenção e globalmente considerada como uma questão local, mas o papel do comité de água na gestão não esta claro a nível das comunidades. A articulação entre a liderança, os membros do comité e o nível de governação na aldeia e mais importante para sustentabilidade dos PSA do que o funcionamento normativo adequado do comité. Líderes das comunidades mantêm um papel fundamental na manutenção dos PSA e o comité aparece apenas responsável por manutenção de rotina e pequenos reparos. Somente os líderes são capazes de mobilizar a comunidade para angariar fundos complementares quando necessário. A centralidade da liderança para a acção colectiva parece prevalecer contra o conceito ocidental de

auto-ajuda e organização (Cammack, 2012). Então finalmente, a sustentabilidade reside na capacidade de mobilização do líder. Depende do valor agregado de um ponto específico de água (com notavelmente sua salinidade relativa em comparação com outros pontos de água), mas também dos processos políticos internos da comunidade e confiança na liderança. Qualquer intervenção que enfraquece a coesão e aprofunda os conflitos envolvido a(s) liderança(s), por exemplo, intervenção com falta de transparência ou intervenção cobrindo a um número muito reduzido de beneficiários, enfraquece os processos de coordenação ou a capacidade de acção colectiva e, consequentemente, a sustentabilidade dos PSA. Em outras palavras a trajectória de implementação do projecto / programa e o bom ajuste entre a governação da comunidade e sistema de governação local de água importa mais que as " boas praticas" melhores do comité de água.

Estes resultados requerem uma adaptação das intervenções de PEC nas aldeias e o desenvolvimento de das capacidade dos técnicos a serem mais sensíveis ou conscientes da dimensão social e política de gestão de infra-estrutura (de água). Os projectos devem ter uma estratégia bem definida de entrada nas comunidades, que precisa ser afinada ao contexto sociopolítico específico local. Nas comunidades onde existe tensões, uma maior atenção poderia ser dados para o desenvolvimento de mecanismos que podem lidar com as preocupações de longo prazo em uma determinada comunidade e as questões de transparência. Em uma vila com boa coesão / funcionamento social, seria possível um apoio mais level que poderia por exemplo se focar na criação de comissão e treinamento técnico e, para em seguida, sair, enquanto que em uma comunidade onde há atrito e menor coerência, seria necessário para dar apoio a longo prazo que ajuda a suavizar as relações, com especial atenção para a processos de transparência e comunicação.

A SUSTENTABILIDADE ECONÓMICA INCERTA DA IRRIGAÇÃO DE PEQUENA ESCALA

Irrigação de pequena escala não é uma inovação por si: as elites locais já usavam moto-bombas antes da independência. Mas na última década, ONGs e governo patrocinaram o desenvolvimento de associações de irrigação como mecanismo de alívio à seca. Mais recentemente, o sistema FDD tem impulsionado por um tempo o desenvolvimento de irrigação individual de pequena escala, através do financiamento de moto-bombas, insumo e cercas. Isto levou ao desenvolvimento de quatro principais modelos de governação de irrigação em pequena escala em Mabalane nomeadamente (i) o "herdeiro em irrigação" razoavelmente bem sucedido produzindo para o mercado (ii) "o recém-chegado na irrigação" que se esforça ainda para dominar as competências técnicas e económicas da irrigação de sucesso (iii) o modelo de "associação" que enfrenta dificuldades económicas e diminuição de membros (iv) o modelo "parceria" caracterizada pela divisão desigual da terra, dos custos e do trabalho.

A finalidade da irrigação varia em cada modelo e pode ser uma actividade geradora de renda e / ou de segurança alimentar. Neste caso, a irrigação é vista como um sistema de alívio à seca que visa à compensar a baixa produtividade da agricultura de sequeiro em ano de seco. No entanto, o período de escassez de comida e de fome e concomitante com a estação quente e seca, com os mais altos nível de evapotranspiração e, consequentemente, os altos custos de bombeamento. Irrigação em pequena escala durante a estação de pós-chuva (Abril – Junho) é mais acessível, mas a concorrência por mão de obra é muito alto nesta época do ano, que também exclui os pobres que tem uma disponibilidade limitada de mão-de-obra. Assim, as famílias de baixa renda tendem a ser excluídas dos pequenos sistemas de irrigação seja por dinheiro ou disponibilidade de trabalho.

A sustentabilidade económica da irrigação pequena de escala é também limitada pelo mercado local. A sustentabilidade é especialmente desafiadora para as associações de agricultores de subsistência que tem, não só, de dominar as competências de gestão técnica e económica da irrigação, mas também as competências de coordenação, organização e gestão de conflito. Essas competências de coordenação são sistematicamente esquecidas ou subestimadas nas intervenções externas, que muitas vezes assume que a capacidade de acção colectiva é uma qualidade intrínseca das comunidades. Mas, na África Austral, a acção colectiva gira mais em torno da qualidade de liderança local, e grupos de auto-ajuda ou associação autónomos são raros (Cammack 2012).

Além disso, o desenvolvimento de subsídios para irrigação em pequena escala através do FDD mudou o status das terras irrigáveis que passo de ser um bem público (para a produção de alimentos para o colectivo durante o período de fome) à um recurso económico (para actividades geradoras de renda). Em muitas aldeias esta foi acompanhada pelas renegociações dos arranjos fundiários que beneficiavam as associações o que contribuiu a comprometer ainda mais o funcionamento da associação.

Finalmente, quem usa dispositivo mecânico na colecta de água deve ter uma licença e pagar pelo consumo. Por enquanto, a autoridade de água (ARA SUL) só licencia os usos nos rios permanentes da Bacia do Limpopo: os usuários em Mabalane ainda não são afectados. Enquanto os usuários de grande escala estão em posição de negociar acordos especiais com a autoridade regional de água, tanto em termos de licenciamento que de pagamento, os usuários de pequena escala não são sequer representados no órgão consultivo de bacia (comité de bacia). Várias estratégias foram introduzidas para lidar com as dificuldades de licenciamento e arrecadação dos pequenos usuários. Uma delas é contar com os intermediários encarregados de identificar os pequenos usuários e arrecadar a taxa. Além de melhorar o registro dos usuários, este sistema de Ponto Focal poderia melhorar o intercâmbio de informações sobre gestão de recursos hídricos na bacia, e melhorando assim a visibilidade dos usuários de pequena escala. Melhorar a comunicação seria particularmente importante para a autoridade de água e grupos de interesses lidar com eventos extremos, como inundações. Mas, de momento, essa potencialidade não é realmente aproveitada.

RUMO AO PLANEAMENTO INTEGRADO DO DESENVOLVIMENTO, COMBINANDO A GESTÃO DE RECURSOS NATURAIS E DESENVOLVIMENTO DOS PEQUENOS SISTEMAS DE AGUA

A água é apenas um dos recursos naturais mobilizados pelos residentes para a sua subsistência, juntamente com terras agrícolas, florestas e área de pastagens. Há ligações directas entre a exploração dos diferentes recursos. Por exemplo, a irrigação é muitas vezes financiada pela exploração de carvão ou a localização dos recursos hídricos determina área de pastagem e consequentemente alimenta os conflitos entre agricultores e proprietários de rebanhos.

Consequentemente os PQS e desenvolvimento do distrito não podem ser desconectados da gestão integrada dos recursos naturais. O planeamento deve levar em conta não apenas as ligações entre os diferentes recursos e as infra-estruturas, mas também as relações entre as áreas ribeirinha e do planalto, com os mecanismos de segurança alimentar e os outros instrumentos de desenvolvimento, como FDD; Esta em jogo aqui (i) promover a cooperação e coordenação entre as diversas organizações e actores que em prática determinam a boa gestão pública (ii) utilizar os diferentes instrumentos de gestão do distrito (PESOD, FDD, os subsídios do INAS, as intervenções de projectos, os 20% dos recursos naturais, etc), para apoiar a linha

estratégica do distrito em termo de desenvolvimento tomando em conta os impactos nos recursos naturais do Distrito.

Uma actividade piloto foi assim iniciada com o governo distrital, serviços técnicos para desenvolver uma ferramenta de discussão do planeamento na forma de um modelo não computorizado de simulação que representa a gestão de recursos naturais em duas aldeias. A ferramenta está a ser testada com os conselhos consultivos como forma de envolver um debate sobre o planeamento integrado

EXECUTIVE SUMMARY

With the adoption of the strategic plan for the reduction of absolute poverty (PARPA I) and its sequels the Government of Mozambique put officially poverty alleviation in the center of its preoccupation. This study aims to examine the use and impact of pro-poor clauses in Mozambican public policies related to water in the Upper Limpopo Basin. In this semi-arid area water access is closely related to the issues of land access, infrastructure development, food security and resilience to extreme climatic events (drought and flood). Five main instruments or processes have been investigated: (i) the development of small water infrastructures, especially the improvement of domestic water supply through the PRONASAR program and the development of small-scale irrigation (ii) the social security interventions for the destitute poor mainly the subsidies to targeted households and food security program of INAS (iii) the response to the 2013 flood (iv) the Local Development Funds to support income generating projects (*Orçamento de Investimento de Iniciativa Local)* (v) the local planning process and role of consultative councils in the implementation and coordination of theses interventions.

This study was developed in the district of Mabalane, one of the 5 districts of the Gaza Province in the semi-arid Upper Limpopo Basin, a little populated and mostly agro-pastoral district. A three steps approach was used: (i) The institutional framework was first characterized by literature review and key-actors interview at national level (ii) Then the implementation of the main policies related to vulnerability and water was investigated using a public policy analysis approach by interviewing key local actors and qualitatively exploring water use, access and management in twelve communities (iii) At last, the perspectives about equity and water management at village level were investigating with a survey sampling 119 villagers in three riverine villages. In each village the leader was asked to rank households in 4 wealth groups (*Poorest, Poor, Middle and Better-Off)* and twenty percent of each group were them randomly selected and interviewed.

CHARACTERIZATION OF POVERTY

Mabalane is not the poorest of the poor districts of the Limpopo basin, yet it ranks in the 4th quartile of the poorest districts of Mozambique according to official ranking based on nutrition, food security and access to public good indicators. Water access is a key determinant of poverty: In Mozambique the very poor receives the worst services in term of quantity and accessibility, which in turn aggravate their poverty status (Zita et al. 2012).

According to leader classification, the two lowest income groups in our survey (Poorest and Poor) represented nearly two thirds of the sample (respectively 21 % and 42 %). In this drought prone area, leaders 'characterization of poverty emphasized the role of assets such as tillage equipment, workforce, and non-agricultural incomes (remittance, local business, charcoal making). Excess income if any is principally invested in cattle and limited housing improvement. Yet the average number of 20 heads of cattle for the Better-Off household points out to limited wealth accumulation. The only significant differences between the lower incomes groups (group Poorest and poor) and higher income groups (group middle and Better-Off) concerned the household workforce, poultry and heads of cattle.

According to this classification, poverty is the condition which limits the household ability to make use of the opportunities that are being offered by the environment. In a rural and distant district such as Mabalane, opportunities are predominantly related to access to natural resources which in this semi-arid area are: the alluvial terrace land permitting occasionally productive flood/water recession crops or unreliable rain-fed agriculture; the sandy land on higher ground permitting only hazardous rain-fed agriculture; the Mopani woodland with his biodiversity (fauna and flora) and wood product; the superficial water resources of the Limpopo river and (saline) groundwater.

But these resources are unequally spread on the territory and the services provided by ecosystems vary in the district territory. Spatial distribution of ecosystem service matters all the more in a district like Mabalane than limited infrastructure, households' assets and institutional framework such as the Limpopo National Park (LNP) regulations restrict access and use of these resources. Moreover employment or economic opportunities related to market are nearly inexistent or extremely localized.

Indeed there are indication that poverty level varies between the four main identified areas notably between (a) the riverine villages of the right margin of the Limpopo River which have access to alluvial terraces and water resources but restricted forest product and grassland surface (b) the Plateau villages with no access to superficial water but larger provision of forest and grassland ecosystem and (c) the left margin riverine villages constrained by the LNP regulations. Accessibility and distance to the main market and administrative centers further structure the district territory. Data, which collected by administrative posts and not by ecosystems zones are missing to precisely quantify the impact of these differences. Yet there was a clear unequal access to domestic water supply prior to the PRONASAR interventions: the Limpopo riverine villages were better equipped than other villages especially those located in the southern part of the district (closest to tarred road) or in the surrounding of Mabalane-Sede.

The general name for poverty in Ronga/Shangana emphasizes the dual attribute of material poverty and social isolation (Tvedten et al. 2010). While leadership position were always hold by household from the two highest income groups, interestingly other responsibilities (such as advisors, party membership or traditional medicine) could be entrusted to households from the lowest income groups. This suggests that other criteria than wealth presides to the involvement in community life and/or that *Poorest* households may not have the abilities or opportunities to make the most of the opportunities offered by their position as other more wealthy households.

As underlined by other studies, mutual help groups connected the different households at village level. They allow households to cope with occasional labor shortage by reciprocating small gifts or retribution. Participation in occasional mutual exchanges (principally *Matsimo*, occasional weeding work in exchange of gift – for example alcoholic drink - and *Kurimela/kurimeliss,* working in other's plot in exchange of money) increased in the lower wealth group. While two third of households engaged into occasional mutual help exchange only 35 % of interviewees resorted to regular exchanges mostly *Kukashela/kukashelissa* that is the exchange of workday against tillage equipment the main way by which poorest household *machamba* are ploughed. But these mechanisms remain little effective for the most vulnerable: they are the least able to reciprocate due to their limited workforce and the very limited monetization of the villages constraints monetary exchanges.

ADDRESSING POVERTY AT COMMUNITY LEVEL

LIMITED EFFECTIVENESS OF THE PRO-POOR INTERVENTIONS AT COMMUNITY LEVEL

On paper, only two types of interventions explicitly target the most vulnerable of the communities namely the INAS programs and the drought/flood relief operations, both of which have limited scope in time and/or space.

Although the number of persons reached by INAS subsidies or food security interventions have increased in the last years to reach 13 % of district households, only eight of the 43 villages or communities were concerned; Households from all wealth groups mentioned having benefited from these programs, but the percentage of beneficiaries increased in lowering income group.

Poverty and vulnerability to risk are linked and flood risks are unequally imposed on households: The *Poorest* households even if the least equipped were those who reported the more important loss of equipment. Yet perception of the flood is globally positive mostly because flooding increases fertility and allows for extensive and productive flood recession crops: 2013 was actually considered as the best agricultural year of the last decade. Even so the first weeks after the flood were a difficult time because flood destroyed the very first crop much in demand at the end of the hungry gap period and replanting is necessarily limited by seed availability.

Two types of interventions were implemented: The NGO "*Save the Children*" subsidized agriculture inputs and small equipment by distributing vouchers of a 1500 MT value to 2000 beneficiaries in the 37 riverine communities. Beneficiaries defined as the "*most vulnerable*" and the "*most impacted by the flood*" were to be directly selected by the NGO at village level. In practice this selection was left to the responsibility of village leaders due to lack of time and transportation mean to visit the villages. Leaders also played a key role in the normal administrative selection circuit used in the distribution of the government relief package. Seeds allocation was left to the discretion of the District technical services: If more than half of the seeds were allocated to the locality administrative unit that to be dispatched to villagers, the quantity received by families was insignificant(less than 0,5 kg). One third of the allocation was divided between technicians, "emerging" farmers and irrigation associations.

At village level village responsibility or party membership clearly increased the likelihood of benefitting from government interventions even if *Poorest* households did also profit from the scheme. The proportion of the *Poorest* households included increased in interventions that explicitly targeted the most vulnerable. Globally higher income households tended to receive more government support while the NGO vouchers benefited equally to all wealth group but not necessarily more to the *Poorest* one. Thus targeted interventions help to correct the shortcoming/ flaw of administrative distribution mode but are not void of elite capture. In any case the proportion of wealthier households that seized intervention varied in the three villages which draw attention to the gatekeeping role of leadership at community level.

THE GATEKEEPING ROLE OF VILLAGE LEADERSHIP

There are quite complex arrangements between inherited (traditional) leadership and elected leaders as well the respective leaders' advisors and ad-hoc committee created by external

intervention. As the 2nd scale leader is the official interface between the community and external world, this leader plays a key role in the dissemination of information and communication. While some leaders are accountable to their community and trusted, many act as gate-keepers and generate low trust or distrust. Project/program information is often circulated only within the first circle of leader(s) advisers in which ad'hoc committee are generally selected. Operations that have direct economic potential compared to public services interventions are particularly at risk. For these reasons, entry strategies of external intervention and intervention implementation pathways play a key role in maintaining community cohesiveness and trust. Any existing tensions will be amplified through non-transparent or poorly accountable external intervention that erodes community trust.

THE AMBIGUITIES OF THE FDD PROJECTS

The District Development Fund is being presented as a poverty alleviation mechanism, permitting to develop income generating projects. In the last 3 years of its implementation in Mabalane District it has funded some 141 projects. As in all Mozambique, the reimbursement rate (10 % of the sum due in Mabalane) remains low but pressure for repayment has been increasing in the district in the last year with some (limited) impact. There is an increasing interest for animal breeding may be because debt can be easily repaid by offspring.

District councils play a real role in FDD allocation and assessment of project promoter's trustworthiness. There seem to be little competition locally between projects except in the main vilas: the most rural administrative post even reported difficulty to fully allocate his share. Excess is being reverted at district level which mostly benefits Mabalane-Sede area which concentrates the larger number of civil servants and elites. Indeed as underlined by CIP monitoring in Mabalane and others districts, district elites such as business people and public servants are the one that benefit the most of the scheme. Most beneficiaries from villages come from the same community and only two households of our sample had had a project funded by this scheme.

The main problem is that this type of project and funding are unlikely to respond to the need of the poor for different reasons. They are no mechanism to deal with the important risks (drought, death of the main workforce of the family etc) that can derailed even the most trustworthy and hardworking beneficiary: the household with limited assets would be in a very difficult situation to compensate for any unexpected loss. Besides local village context is characterized by important climatic risks, very limited monetization and very narrow market opportunities, market movement being even restricted at district level. In this context most activities can only marginally provide a surplus to increase income and food availability and in the same time pay back the loan. Moreover few project can provided significant employment basis. For example, a 4/5 ha irrigation scheme used mostly family workforce. To be successful many poor people would need (long term) technical support for the implementation of their project: Even activities more adapted to poverty alleviation such as project geared toward small animals breeding such as small ruminant or poultry should be associated with adequate veterinary support. Yet technical services prioritize support to emerging farmers. The role of FDD projects in poverty alleviation at village level is thus debatable.

Implicitly this type of mechanism assumes poverty to be exclusively driven by lack of access to (financial) resources and material assets. But except for the most destitute, poverty do not only derive from shortage of assets (inclusively financial ones) but the ability to make the most of existing opportunities due to the lack of social and political capital constraints. It is then no

surprise that the OIIL funds have very limited direct or indirect impact for the poor at village level at the moment.

LOCAL PERCEPTION ON EQUITY FAVOR BLANKET APPROACH BUT THERE IS SPACE FOR TARGETED INTERVENTION TOWARD THE MOST VULNERABLE

Two exercises were undertaken to assess the local perspectives concerning equity. In the first one, interviewees were asked to select a card between four options proposing different approaches to distribute an emergency scheme based on subsidized vouchers. In the second one, interviewees were asked to select their three favorite development options and three least favorite ones in a package of 18 options.

Contrary to technicians who prefer to favor people that are the most able to take advantage of the support provided for example household with higher resources level, villagers globally favored "blanket" approaches (intervention that reaches all village households) or development options that benefited the community as a whole such as public services or equipment. They tended to reject interventions that benefited a very small number of people or could be controlled by a few families as they generated envy and internal conflicts in the village. This included "*demonstration*" scheme for new technology (agricultural demonstration, tank cistern etc) which is perceived as a favor toward beneficiaries. They stressed the importance of options or arrangement that could enhance village cohesiveness and trust and/or limit distrust and envy. Breeding (goat or cattle) was more valued for their food security potential than irrigation. Options that minimized labor mobilization or need also retained attention.

After the "blanket" approach, the second best option was the targeted intervention toward a specific vulnerable group. It was even a first choice for villager from average wealth groups. Indeed, our study brought to light existing pro-poor mechanisms at community level such as special water tariffs for the most deprived households. Yet, nor this pro-poor tariffs nor the criteria to access them appeared to be well shared. In conclusion targeted intervention can be acceptable provided village is involved in the definition of selection criteria and an posteriori control of recipients is undertaken to guaranty transparency.

BALANCING WATER ACCESS AT DISTRICT LEVEL

WATER SALINITY AS A KEY ISSUE FOR USE AND LONG TERM ACCESS

With 30 new boreholes and 9 rehabilitations undertaken between 2011 and 2012 the PRONASAR program have indeed increased (of 52 %) the number of functional water points in the district built, a significant outcome in this water deprived district. Yet (domestic) water access remains a key preoccupation for most interviewees even if they belonged to communities with PRONASAR boreholes. There was beside no consensus on the best type of small water infrastructure (SWI) (boreholes/small water system) and whether to accept saline borehole. Interestingly two different words were used in vernacular language to characterize water salinity (one translated in saline and the other as bitter) a difference that needs to be further investigated.

In the sample studied, each person used in average 18,9 liter of water per day with no statistical difference between wealth groups. This value corresponds to a "substandard service", slightly below the normative basic service level (above 20l/day per person) (Zita and al, 2012). The "comfort" zone for inhabitants per borehole was well below the 300 level retained by the government and approached 100 borehole/family or below. Because of groundwater salinity, some households especially those with transportation and labor availability still used river water in spite of acknowledging its lesser hygienic quality. A few families also occasionally collected rainwater mostly during the rainy period.

In this challenging environment it would be interesting to explore more systematically the comparative advantages of other type of infrastructure than manual boreholes such as small water system pumping from the river or small reservoirs in term of quality, investment and operational cost. As pointed out by district technicians, these latter options are probably the only sustainable solutions in the Plateau area. But they have their own specific constraints which have to be investigated and debated openly with the population. Multiple-use reservoirs would necessitate specific water treatment with consequences on management complexity and operational costs and consequently tariffs. Pumping also increases management costs which can be a limiting factor as underlined by difficulties of existing small water system in some villages. Pumping equipment can also be vulnerable to flood and drought risks.

THE DRIVER OF SPATIAL DEVELOPMENT: PROJECT IMPLEMENTATION AND HYDROGEOLOGICAL CONSTRAINTS

It is fair to say that District government has been striving in the last years to promote a more balanced development for example by encouraging NGO or external interventions to intervene in the underdeveloped areas notably in the PNL buffer zone. Yet this strategy faces limit in the case of water access because of the hydrogeological heterogeneity of the territory as underlined by the difficulties of the PRONASAR program.

Initially the district government had allocated an equal number of boreholes in each administrative post which were allocated by Post Consultative councils to villages. But in some area, it proved difficult to find site below the locally chosen cutting point of 5000 µS/cm (for a national norm of 2500 µS/cm). As the contract end was approaching, technicians and district government decided to focus in the Plateau area of the Combomune administrative post were it had been proved easier to find adequate drilling sites. As a result, the initial spatial inequality in term of water access has been partially corrected but the villages situated in the buffer zone remained less well deserved that other area (Plateau and riverine area).

In the past project based approach using relatively short timeframes, politicians' interference and/or top down pressure for accountability where achievements are measured with quantitative indicators have increased the spatial differentiation of poverty: area with easier access or higher chance of success were more likely to be targeted than others. As in other African countries (Booth and Cammack 2013b) the functioning of state services are still very much shaped by external aid and politicians interference. The interaction between these mechanisms tended to fuel the vicious circle of investments in some communities in detriment of others. It also contributes to weaken civil service compliance to regulation in the existing

context of pocket of neo-patrimonialism[2] e.g the control of state resources and maintenance of political power to perpetuate patron-client relationships.

Efficiency indicators exclusively based on concrete program/project outcomes such as number of boreholes do not give enough importance to the quality of the implementation process which plays an important role in the sustainability of their intervention. There is thus a need to enlarge the set of indicators used by project, program or policies monitoring in order to better account for to the quality of implementation. For example, the PRONASAR intervention could refer to the number of reference of the project in Consultative Councils meeting minutes, the number of transcription in village book (for water tariff) collect or the number of farmers effectively involved in irrigation for each moto-pump.

SUPPORT TO DECENTRALIZATION: STILL A LONG WAY TO GO

The PRONASAR intervention explicitly aimed to support the ongoing decentralization processes of Mozambican institutions. This was undertaken by putting the provincial level in charge of the management of the program, except for the development of the small urban water system for Mabalane Vila which was managed at central level. But in practice the mechanisms used while strengthening the role of the provincial administration and technical services contributed to partially disempower the district technical services.

While it was clear that they has been capacity building and learning of administrative mechanisms at provincial level, for most state agents the objectives of the program were limited to its bureaucratic or administrative dimensions such as providing working equipment and funds to the administration. Although district level staffs have been mostly involved in monitoring the contractors 'works and providing indicators, information or data was being perceived as a demand of Provincial (or National) level, not a basis for their daily work and/or decision making. It is remarkable for example that none of the very numerous indicators collected in communities by the PEC contractor was available at district level and when available they included clerical error. The functioning seemed to have reinforced the dependence links of the district technical services to the Provincial level. Hierarchical functioning and top down pressure is by no mean negative per se as is necessary to discipline state agent to go beyond the capture of aid and program rent to foster impact on the ground. Yet it must leave space to coordination processes and crafting of local arrangement fitting local situation. In Mabalane the coordination processes and working interactions between district technical services could clearly be improved. Moreover innovative ideas to adapt to local situations and challenges such the sponsoring of borehole spare storage through FDD project were stalled and sometimes not even brought to the attention of provincial or national level.

Moreover the Consultative Councils have been underused during the intervention. They are by law involved in the district planning processes and selection of FDD projects. Although clearly being controlled by administration and party, these institutions are fully functioning. They meet on a regular basis and minutes of meetings are available, which occasionally report dissent to service functioning or complaints. These minutes also indicates that, just as catchment

[2] **Neopatrimonialism is a system where patrons use state resources in order to secure the loyalty of clients in the general population. In other word a system where officials occupy bureaucratic posts less to deliver public goods and services than to acquire personal wealth and status.**

committee, they are used much more as an information transmission arena than a consultative body except for the allocation of FDD in which councils plays a real indicative role.

The PRONASAR program was indeed presented to Consultative Councils (at least at district and post level) as proved in the minutes at its very beginning, but they were afterward very little references to its development or problems met in the minutes except to references to the delays in the development of the small-water system of Mabalane-Vila. A better use of these councils during the elaboration and implementation phase of such a project could probably help to adapt it to district local specificities. It would have in any case contributed to bring the perspectives of local inhabitants as well as to bring into light local knowledge (salinity, equity issues etc). As the place where different rationale and perspectives on equity (politicians, technical and community) can be confronted, debated and blended, Consultative Councils should pay a larger role in the allocation of means, in the district, administrative post and locality planning process as well in the crafting of local solution.

GOVERNANCE AND SUSTAINABILITY OF SMALL WATER INFRASTRUCTURES

IN THE LOCAL CONTEXT GOOD LEADERSHIP IS MORE IMPORTANT THAN FORMAL COMMITTEE FUNCTIONING FOR SWI SUSTAINABILITY

PRONASAR put a strong emphasis on the restructuration of the maintenance model. With officially 25 % of non-functioning boreholes (20 % is the National average) maintenance appears an important issue for water access in Mabalane.

An historical analysis of borehole functioning and maintenance revealed that access to spare or capacity is not the main limiting factor to reparation in the area except for very specific case (e.g no more seller in Mozambique of the type of hand pump so no available spare at all). Consequently it is likely that development of a local supply chain as planned by the PRONASAR will not so much reduce the % of non-repaired boreholes (abandoned) but the delay to repair them.

Money thus seems to be more limiting than spare availably. The survey does not point out toward major transparency issues with 87 % of people informed of money use and 84 % approving the use. Yet the program gives a specific attention to structuring water committee under the assumptions that a fully staffed committee lowers the risk of money mismanagement. According to the inspection of one village book and the survey between 55 or 60 % of villagers are in time with their water tariffs payment. *Poorest* households are proportionally much later than other households which emphasizes the need for “social water tariffs”. They were introduced in some village by the NGOs that implemented the first boreholes but although included on paper in the PRONASAR program this possibility has never been debated with the population. Indeed none of the pro-poor clauses of the PRONASAR program have been explicitly implemented: no technicians mentioned any training on this dimension by opposition for example of the gender aspects.

On this basis the money easily available at village level for borehole maintenance varies between 5000 to 12000 MT depending of the number of users per borehole. Consequently a threshold of 10000 to 12000 MT for state intervention could be recommended and a corresponding sum included in annual SDPI budget to allow rehabilitation or repair out of the reach of villagers. .

Community responsibility for SWI management and maintenance was not challenged and maintenance was globally considered as a local issue but the role of water committee in management was unclear. The articulation between leadership, the key committee members and the village governance level was more important for SWI sustainability that proper normative functioning of the committee. Village leadership keeps a key role in SWI maintenance and the committee appears only responsible for routine maintenance and small repairs. Only leaders are able to mobilize the community to gather complementary funds when necessary. The centrality of leadership for collective action seems to prevail against the westerner concept of self-help and organization (Cammack, 2012). So finally the sustainability lies in the mobilizing capacity of the leader. It depends on the added value of a specific water point (with notably its relative salinity compared to other water points) but also to the internal politics of the community and leadership trust. It appears that any intervention that weakened cohesiveness and enhanced village leaderships conflicts, for example intervention with lack of transparency or intervention reaching a very small number of villagers weakened coordination processes or collective action capacity and consequently SWI sustainability. In other word what matter is project/program implementation pathway and the good fit between village governance and the water local governance system rather than "committee best practices".

These results calls for adapting PEC interventions at village level and the building of technicians' capacity to be more sensitive or aware of social and political dimension of (water) infrastructure management. Projects should have a clear well defined entry strategy into a community which needs to be finely tuned to specific socio-political contexts at the village level. In communities where tensions have been identified, a closer attention could be paid to the development of mechanisms that are designed to address long term concerns in a given community and transparency issues. In a village with good cohesion/social functioning, less support would be possible and the support could, for instance, focus on setting up the committee and training and then exiting, whilst in a community where there is friction and less coherence, it would be necessary to give long term support that helps to smooth out relationships, with specific attention to transparency and communication.

THE UNCERTAIN ECONOMIC SUSTAINABILITY OF SMALL IRRIGATION

Small irrigation is not an innovation per-se as local elites were already using moto-pumps before independence. But in the last decade NGO and government sponsored the development of associative irrigation as a drought relief mechanism. More recently, the FDD system has boosted for a while the development of individual small irrigation by funding irrigation equipment (moto-pump), inputs and fencing. This led to the development of four main model of governance of small irrigation system in Mabalane namely (i) the rather successful market oriented 'irrigation heir' (ii) the irrigation 'new comer' struggling to master the technical and economic skills of irrigation (iii) the struggling 'association' model with shrinking membership (iv) the 'irrigation partnership' characterized by unequal division of land, cost and work.

Purpose of irrigation varies in each model either as an income generating activity and/or food security. In this case irrigation is viewed as a drought coping system aiming at compensating poor rain-fed crop. Yet the hungry gap season is also the dry hot season with the highest level of evapotranspiration and consequently pumping costs. Small irrigation during post-rainy seasons is more accessible but competition for labor is very high at this time of the year which also excludes the poor which are characterized with limited labor availability. Thus the lower income households tend to be excluded from small irrigation system either by cash or labor availability.

The economic sustainability of small irrigation is also constrained by limited local market. Irrigation sustainability is specially challenging for smallholder association which has not only to master the technical and economic management skills of irrigation but also the coordination and organization skills. These later skills are systematically discarded or undervalued by external intervention which often assumes than collective action capacity is an intrinsic quality of community. But In Southern Africa collective action revolved more around the quality of local leadership and autonomous self help group or association are rare (Cammack 2012).

Moreover the development of subsidies for private small scale irrigation through OIIL funds has changed the status of irrigable land from a public good (for collective food production during the hungry gap period) to an economic resource (income generating activities). In many villages this was accompanied by the renegotiations of land tenure arrangement which benefited associations further jeopardizing the functioning of association.

Lastly water user using a mechanical device is supposed to obtain a license and pay for the water abstracted. For the moment, the water authority (ARA SUL) is only licensing users of the permanent water bodies of the Limpopo Basin: Mabalane river users are not been targeted for now. While Large-scale users are in position to arrange special agreements with the regional water authority both in term of licensing and payment, small scale users are not even represented in the catchment consultative body. Several strategies have been introduced to deal with the difficulties to register and collect money from the small users. One of them is to rely on intermediaries in charge of identifying small users and collecting there fees. Beyond improving the registration of users, this Focal Point system could improve the exchange of information regarding water resource management in the basin, and thus improving small scale users visibility. Improving communication would be particularly important for the water authority and water stakeholders when dealing with extreme events such as flood. But at the moment the advantages are not fully used.

TOWARD INTEGRATED DEVELOPMENT PLANNING COMBINING NATURAL RESOURCES MANAGEMENT AND SWI DEVELOPMENT

Water is only one of the natural resources mobilized by villagers for their livelihoods along with crop land, forest product, and grassland area. There are direct connections between natural resources exploration. For example irrigation is often funded by charcoal exploration or the localization of water resources determines grazing area and fuels conflicts between farmers and herd owners.

Consequently SWI and district development cannot be disconnected from the integrated management of District natural resources. Planning must take into account not only the links between the different resources and their related infrastructure but also the relationships between the riverine and Plateau area, the food security mechanisms and other development instruments such as OIIL; What is at stake is (i) promoting the cooperation and coordination between the several organizations and actors that in practices orient public good management (ii) use the different district management instrument (PESOD, OIIL, INAS subsidies, project interventions, 20 % funds for natural resources etc) to support the strategic line of development taking into account their impact of overall natural resources at district level. A pilot activity have thus been initiated with the district government, technical services to develop a planning discussion tool in a form of a simulation non computerized model representing the natural resources management in two villages of the district. The tool is being tested with consultative council as a way to engage a debate concerning integrated planning.

PUBLIC INTERVENTIONS IN THE SEMI-ARID PART OF THE MOZAMBICAN LIMPOPO BASIN

In the early 90s in the post-civil war context and drought situation that prevailed in Mozambique, most of interventions in rural areas in Mozambique were related to emergency projects sustained by external aid and steered by various NGOs. In the semi-arid upper Limpopo basin these projects dealt mostly with the development of boreholes and health issues. Emergency and NGO interventions increased following the 2000 flood and 2003/2004 drought: They sponsored the development of small water systems, small collective irrigation scheme first with manual irrigation and with small moto-pumps afterward.

At the end of the 90s and under the recommendation of Bretton woods institutions the Government of Mozambique (GoM) has adopted a strategic plan for the reduction of absolute poverty (PARPA I 2001 – 2003) followed later by its sequels (PARPA II 2003 – 2006) and the Plan for the Reduction of Poverty (PARP III 2006-2009 and PARP IV 2010-2014) (GdM 2001, 2005, 2009, 2011). These strategic plans are the policy instruments which orient investment and government planning. They are meant to oversee the planning system which works from district level, to the provincial and national level (PES and O/E and mobilize financial resources either from the state and external financial aid. Following the liberalization stance adopted by the GoM, the private sector was given a key role in the PARPs but they also promoted the administrative de-concentration/decentralization by strengthening the role of Provincial and District government. The different levels of government were given a key role in the development of basic infrastructure (notably water, health, education and transport equipment) which are supposed to be coordinated at local (district) level through local planning.

Our study aims to account for the use and impact of pro-poor clauses in different public interventions related to water through a public policy analysis background. In this semi-arid area water and land access are closely related to food security issues and extreme climatic events (drought and flood) relief operation. Four main instruments including explicit poverty alleviation orientation are implemented at district level: (i) the development of public service infrastructure with a special focus on health centers, schools and domestic water supply equipment. (ii) district funds to support small income generating activities (*Orçamento de Investimento de Iniciativa Local* or Investment Budget of local initiative) (iii) the coordination of theses interventions through local planning processes (iv) Social security interventions for the destitute poor.

The PRONASAR program: water access through borehole development, participatory management and sanitation development

Water access is a serious challenge in the upper semi-arid Limpopo basin: except for the Elephants River whose flow is being regulated by the Massingir Dam there are no permanent rivers in the Upper Limpopo basin. Even the Limpopo River may dry up between the months of October and December due to upstream uptake and upstream management of the basin (outside of Mozambique). The semi-arid part of the Limpopo in Mozambique encompasses the districts of Chicualacuala, Mabalane, Chigubo, Massangena and Massingir in the Gaza provinces and the

districts of Mabote and Funhaloro in the Inhambane Province. Our study focuses **in the semi-arid districts of the Gaza provinces**. These districts are according to technicians' perception among the worst Mozambican districts for borehole development (higher depth, higher risk to get salty water, high drilling cost) (MOPH/DNA 2013)(Annex 1). Indeed the WashCost project has underlined how costly is drilling in the Gaza province: with an average of 714 307 MT per borehole (23 810 USD) this province has the highest drilling cost of Mozambique (201 % more than the national average) (Zita and Naafs 2012). This project also estimates that in rural Mozambique, nearly 35% of water facilities were not working or in need of repair while PRONASAR baseline study estimates this number to 20 % (MOPH/DNA 2013).

In order to boost water rural coverage, the National Directorate of Water [*DNA Direcção Nacional de Águas]* has adopted a classical service delivery approach and the rural water sector was reformed in order to move from the traditional focus *on building new facilities, towards setting up institutional and management structures that can maintain and ensure long-term water facilities.* The main instrument for this approach was the implementation of the National Rural Water Supply and Sanitation Program (NRWSSP), or **PRONASAR (Programa Nacional de Abastecimento de Água e Saneamento Rural)** launched in 2010 which is presented in Annex 2*.* The PRONASAR program is an innovative program which follows the Paris Declaration on Aid Effectiveness (2005). This declaration recommends helping developing-country governments to formulate and implement their own national development plans, according to their own national priorities, using, wherever possible, their own planning and implementation systems. In Mozambique various donors (Canada, the Netherlands, UNICEF, Switzerland, the UK and the African Development Bank) abounded a common fund for rural and water sanitation. The program includes a strong decentralization approach with the district being the focal point for planning, implementation and monitoring of the Program dimension (drilling and PEC) while most contracts are being elaborated and managed at Provincial level (Provincial Directorate of Works and Housing or DPOH). The program combines water access with sanitation, emphasizes the sustainability of water infrastructure through involvement of the communities, capacity building and institutional development.

It explicitly comprises a participatory dimension and aims to facilitate the inclusion of the most vulnerable groups: monitoring approach includes indicators related to poverty alleviation which are the incidence of poverty in village (estimated by the % of poor households); % of water sources maintained by communities with pro-poor management rules and regulations; and the % of poor areas and households with access to water and sanitation. The pro-poor approach also includes the priorization of districts and district areas using poverty and equity indicators: areas with low coverage and high poverty are to be prioritized. The active participation of women is also being promoted; The program mentions the need to use of participatory district planning methods (from local development committee to District consultative council) and promotes traditional systems of social support[3] to reach the most vulnerable group as well the building and use of poverty maps or areas with lowest coverage; Capacity building "*notably for women on building self-esteem, strengthening capacity to analyze problems and make equitable and gender-sensitive decisions, and capacity to negotiate, argue and persuade directed*" is to be developed with NGOs support (MOPH/DNA 2009).

In parallel quality of service was redefined and the norms to define good services evolved: a water point should not service more than 300 households instead of the previously 500; water salinity should be below 2500 µS/cm.

[3] **Mutual aid system mostly see (Ducrot 2011)**

Social security mechanisms for absolute poverty alleviation

They are being implemented by INAS (*Instituto Nacional de Acção Social* or National Institute for Social Action) and are still little developed in Mabalane district. The mechanisms includes basic social direct subsidies to targeted households, direct support to older people and orphans, assistance to disabled people, and food security program based on a Food-for-Work scheme. (Annex 4)

District local planning

Public interventions and externally sponsored activities are being developed within the framework of decentralization and should be integrated in the district plan developed with the involvement of the Consultative Councils. The district government relies on a hierarchical structure which ranges from the district to the village presented in annex 4. At each level from district to locality, local consultative councils[4] were institutionalized through the *Lei dos Orgões Locais do Estado*[5] (LOLE) approved in 2003 (Lei 8/2003) and its regulation (Decreto 11/2005). By law these councils which gather coopted members from the state administration (health, education, district government), organized civil society, village and local economic elites are to be involved in the process of elaboration and approbation of the district plans: the District Strategic Development Plan or *Plano Estrategicos de Desenvolvimento Distrital* (PEDDs) is elaborated every 5 year while the annual Economic and Social Plan and District Budget *Plano Economic e Sociais e Orçamento Distritias* (PESOD) (Decreto 11/2005) detailed district yearly activities and budget.

These plans are important for water as they detail the infrastructure investments for the next year (PESOD) and 5 years terms. While planning follows a bottom-up approach, funding depends of government funds allocation to the district; PESOD is consequently often no more than a "shopping lists" of possible intervention (CIP 2009). This study also underlines that District Consultative Councils (*Conselho Consultativo Distrital* or CCD) have in most district a limited link with PESOD elaboration and are mostly involved in its approbation. They are rarely if ever involved either in the budget execution phase or on the prioritization of activities to be implemented.

Local development fund

Local councils also play a key role in the selection of project submitted the *Orçamento de Investimento de Iniciativa Local* (OIIL) also *called Fundo de Desenvolvimento Distrital* (FDD or Local Development Fund)[6]. Introduced in 2006 this fund aims to reduce poverty by funding individual projects of food production and income or jobs generation by offering a credit opportunity to local people excluded from the formal credit system. The total interest rate is 5 % but there is no strict rule for reimbursement. The few systematic studies on this initiative have non-surprisingly pointed out the larger access of local established elites to the fund and a global failure of reimbursement of the loans. They also underline the relationships between project

[4] Different names in Portuguese: Conselhos Locais (Local Councils), Conselhos Consultativos (Consultative Councils), Instituições de Participação e Consulta Comunitária (Institutions for Community Participation and Consultation)
[5] Law on Local State Bodies
[6] Locally known as "7 milhoes", the seven millions program/fund.

beneficiaries and the structure of power district, notably of the dominating political party in the district studied. In the area studied these funds are notably been used to fund cattle breeding and small irrigation project both having direct or indirect links with water (and land) access and use (see Annex 5).

Relief operations to extreme climatic events

Although their contribution in term of infrastructure development in the district of Mabalane has decreased during the last years NGOs or project-based interventions operationalized by NGOs still play an important role locally. This is notably the case for relief operations in response to extreme climatic events (flood and drought).

In January 2013, the Limpopo Basin faced its most important flood since 2000. In monitoring post of Combomune located in the northern part of the Mabalane district, the flood wave reached 11,88 m, considerably higher than the maximum figure reached in 2000 of 10.97 meters (Flood alert level at Combomune is 4.5 meters). It destroyed the crops situated in the alluvial terraces of the riverine villages of the rivers Limpopo and Elephants, but habitations which are situated on higher ground were not directly impacted contrary to the downstream villages of the districts of Chókwè, Guija or Xai-Xai that had to be evacuated. Floods are not exceptional events, especially in the Elephants River which have faced various small scale floods in the last 10 years in spite of the Massingir dam. Basin manager attributes these events to the state of the dam that was damaged in the 2000 flood and never repaired which reduces its holding capacity: when rainy events occur the dam can only partially delay the flood. Funding was secured in 2012 to proceed to the repair of the dam which would according to managers ensure a better control of flood in the basin. Contrary to the previous small scale floods of the past years, the 2013 flood was responsible for important damages in the middle and lower Limpopo Basin which allowed mobilizing an important relief response from the government and the international community. Various relief emergency initiatives were implemented between March and May 2013, in paper coordinated by INGC the National Disasters Management Institute in charge of coordinating relief operations in case of extreme climatic event . Two types can be differentiated: the government interventions and distributed to normal administrative mechanisms and NGOs interventions

in Mabalane NGOs are still active in issues related to food security and health. They must be registered at district level and they report to the district services to which their interventions relates to and their activities are integrated both in the district plan and its monitoring.

METHODOLOGY

DESCRIPTION OF THE MABALANE DISTRICT

The work has been developed in Mabalane district one of the 5 districts of the Gaza Province in the semi-arid Upper Limpopo Basin; With a surface of 9 100 km^2, it hosts approximately 32 000 inhabitants in 5400 families (density of 3,5 inhabitants/km^2). The district center is linked to Chókwè city - the informal capital of northern Gaza - by a 125 km road (being 100 km non-tarred although a tarred road is expected to be completed in 2014) and a functioning railway. The Limpopo River divides the district from North to South and two third of the population is settled in villages along the river or in the two main rural centers of the district (Mabalane–Sede and Combumune-Estação) which were initially developed as railway settlements.

One third of the population is located in the left margin of the river that is in the buffer zone of the Limpopo National Park (LNP) the Mozambican part of the Transfrontier Park which also encompasses the Kruger Park in South Africa and the Guanaranzhou Park in Zimbabwe.

Geomorphology, transportation network (road and railway) and institutional organization (see Annex 6 for LNP institutional framework) divides the district in 4 main areas:

1) The **two rural centers** of Mabalane-Sede (the district administrative center) and Combumune- Estação located along the main road and train line and located 10 to 25 km from the River. These two centers were created for the operation of the railway and still plays a main role in the operation of CFM (Mozambican Railways) line connecting Maputo to north of the Gaza Province.
2) The **riverine area, on the right margin** between the railway and the Limpopo River. Crops are developed on the alluvial terraces of the river which are submitted to occasional flooding. Higher grounds are devoted to rain-fed agriculture and grazing area which have been recuperated over forested area through the progressive deforestation of the Mopane woodland ecosystem. Grassland areas in the surrounding of the village are often degraded and submitted to erosion due to uncontrolled burning and overgrazing. Consequently their best grassland area are often located quite away from the village on the other side of the railway line (10 km)
3) The **riverine area on the left river margin** which is being included into the **buffer zone of the Limpopo National Park (LNP)**. These communities are submitted to the park specific legislation for natural resources management. Hunting and charcoal making are prohibited and collecting forest products restricted to households use. Due to important conflicts between wild animals and people, a fence is currently being built to separate the buffer zone from the inner zone of the park. This area is of difficult access as there is no bridge in the district. During the rainy season, it might be dangerous and difficult to cross the River and the rivers in the park are also impassable. Between March and August the area is accessible by boat but motorized transport is difficult on this side unless driving from Massingir (a 300 km detour, 200 km on non-tarred road). It is normally possible to cross the river with a car between October and December. By law, twenty percent of the income raised by the LNP is supposed to be redistributed to the communities of the Buffer Zone. Prior to 2012 the Park gave a cheque to district park committees (Annex 7) but since 2012 the money is transferred to the district via the Provincial Government to be distributed to the relevant communities using specific district mechanisms.

4) The **rain-fed area**, with villages located in the **Plateau** area some 10 to 50 km from the Limpopo River. All water bodies in this area follow an ephemeral regime which allow filling to a few small reservoirs, non-of them being permanent. These small reservoirs are the main water resources of the area. Rain-fed agriculture is hazardous due to rain irregularity and livelihood is based on the exploration of the Mopane woodland ecosystem (charcoal making, timber, firewood collection) and cattle breeding in the extended grassland area recuperated over the Mopane forest through controlled deforestation and management.

Mabalane is an agro pastoral district (see Box 1), which counts 32 300 heads of cattle and small ruminants, 54 500 ha cultivated, 39 % of which are located in flood prone areas. In the riverine zone, livelihood relies mostly on agriculture (rain-fed and flood recession agriculture as well as some irrigation), cattle and small ruminant breeding and occasionally charcoal making, migration remittance and hunting/gathering of forest products. In rain-fed area livelihoods are based on animal breeding, charcoal making and forest products gathering along with occasional remittance. Rain-fed agriculture which is more risky plays a minor role. HIV prevalence in the district is high (28 %).

The district is divided in three Administrative Posts themselves divided in Localities and villages as presented in the following table. Each Administrative Post covers more than one type of ecosystem zone.

TABLE 1: NUMBER OF VILLAGE PER LOCALITY AND SAMPLES OF THE STUDY

Administrative post	Locality	Nb of village	Main area	Villages visited during phase 1	Quantitative survey
Mabalane-Sede	Nhatimba	11	Plateau/ rain-fed area	1	
	Mabalane-Sede	5	Plateau and Riverine areas	1	
	Tsocate	8	Riverine area	2	Village 2
Combumune	Combumune estação	10	Plateau / rain-fed area	2	
	Combumune-Rio	14	Riverine and buffer zone areas	2	
Ntlavene	Chipsompsowne	4	Riverine area	1	Village 1
	Ntlavene	10	Buffer zone area	3	Village 3
		62		**12**	

BOX 1: MABALANE IN NUMBERS

Sources PESOD 2012, PEDD 2010, Census 2007, SDAE 2012, data SDPI 2012

A territorial area of 9 580 Km2 for 32 040 inhabitants in 5 400 families: population density of 3,3 hab/km2 allocated in 3 administrative posts: Mabalane-Sede (42 % of population), Combumune (30 %) e Ntlavene (28 %).

The 4th poorest district of the eleven Gaza districts, a province which more or less covers the Limpopo basin area. In Mabalane 72 % of population is below poverty line, varying by administrative post: 55 % in Mabalane-Sede but 80 % in Combumune, 88 % in Ntlavene. Part of the first quartile of the poorest districts in Mozambique

None of its 439 km of roads is tarred;

29 DUATs.

In 2010, area cultivated 54 527 ha involving 5 300 families. 39% of this surface is on the river margin and subjected to flood (PEDD 2010). 43 055 ha cultivated in 2011/12 according to SDAE, 2012.

82 moto-pumps (6 nonoperational) and 25 collective irrigated schemes (SDAE, 2012)

33 300 animals (not including poultry) with 65 % cattle heads, and 25 % goats: 39 % of all cattle are in Ntlavene et 50 % of all goats are found in Combumune (PEDD 2010). Estimation by SDAE are much higher: cattle around 33 400 heads (8 % belonging to commercial farms), goats 43 100, poultry 48 200 heads.

Forests exploration: Charcoal: 120 304 stere (+ 85 % of increase compared to 2011), Fuelwood: 1 840 stere (+ 113 %).

8 natural resources management committees;

18 communities are located in the buffer zone of Limpopo National Park (approximately 30 % of the population of the district and 49 % of the total population in the buffer zone)

HIV Prevalence: 28,7 %;

District budget in 2007: 12.557.981,14 MT

15 NGOs operating in the district in 2012 among which 1 for agriculture and community development, 1 multi-purpose organization including agriculture, 1 for support to the legalization of communities associations. Other NGOs are involved in education, children nutrition and food security and health;

Water:

- 56 boreholes (69 % operational) and 15 small water systems (53 % operational) excluding 2012 new investments (SDPI, 2012).
- 2012 new investments: 30 boreholes and 7 borehole rehabilitated
- 17 small reservoirs

METHODOLOGY

This analysis used a four steps approach: (i) The institutional framework was first characterized by literature review and key-actors interview at national level (ii) Then the implementation of the main policies related to vulnerability and water was investigated using a public policy analysis approach by interviewing key local actors and qualitatively exploring water use, access and management in twelve communities (iii) at last, the perspectives about equity and water management at village level were then investigated with a survey sampling 119 villagers in three riverine villages. (iv) in parallel specific aspects of pro-poor clauses for water management at basin level related were studied (stakeholders participation and licensing).

Characterization of the institutional framework

A first literature review permitted to identify the institutional framework of the Limpopo Basin in Mozambique. This was completed by key actors' interviews at national level focusing on water governance. The outcomes are being presented in the report:

R. Ducrot. 2011. Land and water governance and Pro-poor mechanisms in the Mozambican part of the Limpopo basin: baseline study. CGIAR Water and Food - CPWF Limpopo Basin Challenge, IWEGA, UMR G-EAU, 56 p. + annexes

Analysis of the implementation of main policies related to vulnerability and water in Mabalane district

Different members of the district government were interviewed (administrator, district permanent secretary, administrative post and some locality post chiefs) as well as the head of district services (water, planning, social services, agriculture) and some technicians. Some PRONASAR technicians at provincial level and national level were also interviewed.

Twelve communities located in the 4 areas of the district were also visited (Table 1) between November and December 2012. The village level survey included: (i) an interviews of leaders (ii) focus groups with water committee member and/or irrigation committee members (iii) in two villages focus group with women (iv) transect walk and visit of village SWI accompanied by member(s) of the water and/or irrigation committee. Results were being synthetized in the report:

Ducrot R. 2013. Propoor policies for water access in Mozambican part of the Limpopo basin: example of Mabalane district. : November and December 2012 field visits report. [S.l.] : [s.n.], [65] p.

In May 2013, another field visit focused on the post-flood mechanisms through interviews with district level actors (district services, technicians, NGO members involved in the mechanisms) and village leaders (3 villages).

Quantitative analysis of the perceptions of equity and water management processes at village level

In June 2013 a quantitative survey was undertaken in 3 riverine villages of the district to further understand the perspectives of residents. Villages were chosen to hold more than 200 households, have more than one boreholes and be located in at least two different zone. The PRONASAR data available at district level were used for the selection. The villages selected were located in 3 different areas (southern part of the district, middle part of the district and in the park buffer zone). In all cases the data used for the selection proved incorrect notably in term of number of households: Commonly village list (which is provided by the leader) may count the same household under different name in order to enhance the chance of the household to get access to external support. Besides it seems that village 3 was confused in PRONASAR data base with another neighboring bigger village: this confusion can only explain why this very small village (69 households instead of the 225 households on paper) received a second borehole

while none of the other bigger neighboring villages did. Table 2 summarizes the main characteristic of the three villages studied.

In each village, the leaders were asked to group each households in 4 wealth groups (*Poorest, Poor, Middle and Better-Off*) according to their own perception. Twenty percent of the households in each package were them randomly selected and interviewed. The questionnaire was divided in 4 parts: (i) main characteristics of the households (ii) identification of the source of water used for the different uses and perception concerning borehole management (ii) access to emergency relief aid and project intervention (iii) perception concerning equity and priority interventions at village levels.

TABLE 2: SOME INFORMATION CONCERNING THE THREE VILLAGES STUDIED

	Village 1	Village 2	Village 3
Households number	175 (360 on paper)	334 (492 in paper)	69 (226 on paper)
Interview number	36	66	16
Water sources	River and 3 boreholes (1 old, 2 new PRONASAR)	River, 1 lagoon, 1 reservoir, 3 old boreholes (one non-functioning), 1 new PRONASAR	River (20 mn walking), 1 old borehole, 1 new PRONASAR
Some historical facts	Grouping of two different villages during the "vilagização" process in early 80s.	There used to be Portuguese settlers	A cooperative created to manage the moto-pump of former Portuguese settler but equipment was destroyed during the war Located in the buffer zone and raids from elephants and buffalos were common before the development of the elephants proof fence (2013)
Infrastructure	Health center, Movitel aerial, small solar system INAS intervention (elder) School building in medium state	New Health center School building in bad state	Extremely precarious "school" (traditional material)
NGOs project support	One research-action project focusing on small animal breeding (2008-2010)	Long term intervention of one NGO which is no longer intervening (tank cistern, irrigation, conservation agriculture etc)	No intervention
Associations	Goat breeder association Charcoal making association (non- functioning)		
Irrigation	There used to be an irrigation association no longer functioning 3 private farmers with moto-pumps	One irrigation association 4 privates farmers with moto-pumps	The village created an association and received a moto-pump through FDD project but it was not implemented for lack of skills

In our sample, households were headed at 71 % by men but 54 % of the interviewees were women. Thirty-two percent of the households had at least one member of the household away (in migration for example). Fifty one percent reported having at least one household member

with chronic disease[7] and 32 % at least one member above 65 years. In average households held 8,9 persons with 3,7 children under the age of 15. Village 3 had slightly younger household with consequently smaller family (see Table 3).

TABLE 3: DESCRIPTION OF THE SAMPLE

	Village 1	Village 2	Village 3	Total sample
Age of head of households	50,2 (13,5)	49,2 (14,3)	44,1 (12,7)	48,8 (13,9)
Total family size	8,5 (4,0)	9,3 (5,2)	7,9 (3,5)	8,9 (4,7)
Children less than 15 years old (yo)	3,7 (2,4)	3,7 (3,3)	4,1 (2,9)	3,7 (3,0)
Number of people with chronic disease	0,6 (0,8)	0,7 (0,8)	0,6 (0,7)	0,6 (0,8)
% household reporting people with chronic disease	44 %	57 %	44 %	51 %
Nb of people above 65 yo in households	0,4 (0,8)	0,5 (0,8)	0,2 (0,4)	0,4 (0,7)
% household reporting people above 65 yo in households	31 %	36 %	19 %	32 %
Head of household is a women	27,8 %	32,8 %	18,7 %	29,4 %
Iinterviewee is women	63,9 %	43,3 %	75,0 %	53,8 %
% household reporting member in migration	33,3 %	29,8 %	37,5 %	31,9 %

Average (standard deviation)

The group "Poor" represent 42 % of all interviewees of our survey and the group "poorest" 21 % of our sample. This proportion gives an indication of the size of each group as estimated by the leaders since 20 % of each group was being sampled. The percentage varies slightly by village. In any case they are more villagers in the poorest half of the classification than in the richer half.

TABLE 4: REPARTITION OF HOUSEHOLDS OF THE SAMPLE IN THE DIFFERENT WEALTH GROUPS

	Village 1	Village 2	Village 3	Total
Poorest	25%	21%	13%	21%
Poor	39%	42%	50%	42%
Middle	17%	19%	19%	18%
Better-Off	19%	18%	19%	18%

[7] **With a strong likelihood to be AIDS related**

WHO ARE THE POOR?

POVERTY AS FOOD CONSUMPTION RATE: THE OFFICIAL DEFINITION OF POVERTY

The PARPs defined poverty as '*a multidimensional phenomenon*" and "*the lack of capacity or opportunity* [for individuals, families and communities] *to gain access to minimum living conditions according to the basic standard of society*" (GdM 2011). In order to assess the impact of policy on poverty, a significant monitoring and evaluation effort involving various Mozambican and international institutions (PES, studies of Ministry of Planning and Development (MPD), national surveys of the *Instituto National de Estatistica*, World Bank, UNICEF) has been undertaken. Although poverty has evolved from the strict monetary definition of PARPA I to a broader conceptualization including education, health and assets (Zita et al. 2012) the absolute poverty threshold is still measured by a consumption basis of 2.150 kilocalories by person and by days, increased by a portion of non-food-related expenses. This corresponds to a value very close to US$ 1,00 per person and per day (Parpa II).

According to this measure and except for the district of Massingir, all but one of the districts of the Gaza Province located in the Upper Limpopo Basin are situated in the 4th quartile of Mozambican districts with the highest incidence of poverty (national level). One of them (Chigubo) is also the district with the 2007 highest level of poverty incidence in Mozambique, and one of the few where poverty has actually increased over the last 20 years. Mabalane is the third most problematic district of the Gaza province in term of nutrition index, with a much lower development tax than national level (6,6 % to be compared to the 16 % national level). Chronic desnutrition is also higher than national level (respectively 11 % and 7 %) (PEDD Mabalane 2010)

TABLE 5: EVOLUTION OF POVERTY IN FIVE DISTRICTS OF GAZA PROVINCE OF THE UPPER LIMPOPO BASIN

	Poverty incidence (1997)	Poverty incidence (2007)	Evolution	Provincial Rank (2007)	National rank (2007)
Massingir	67 (5,2)	57 (4,3)	- 15 %	7/12	39 / 57 (3°q)
Mabalane	74 (3,1)	67 (3,8)	- 9 %	9/12	46 / 57 (4°q)
Chicuacuala	78 (2,7)	72 (5,6)	- 6 %	11/12	51 / 57 (4°q)
Massangena	71 (4,6)	71 (4,1)	+ 0 %	10/12	50/ 57 (4°q)
Chigubo	78 (4,4)	85 (3,8)	+ 9 %	12/12	57 / 57 (4°q)

Source: adapted from INE census 97 and 07

Some studies have questioned the approach retained by the GoM to assess poverty based of the consumption level within family unit: Vollner (2012) for example argues that this method is associated with multidimensional gaps as it omits the consumptions of services provided by the government free of charge (or public goods such as streets schools or water) or home produced services. He sustains that from a capability perspectives (Sen 1981), an evaluation of poverty based uniquely on calories consumption undervalue the role of investments and supports to

public goods or services mobilized by individuals over private resources as well as the role of market and private sectors. This approach also does not take into account other indicators of nutrition: while poverty headcount has officially declined between 97 and 03, child chronic malnutrition has rose (Hanlon and Smart 2008). To correct the approach Vollner proposes to complete calories consumption with other set of indicators accounting for Sen's instrumental freedoms (such as good governance, economic facilities or social opportunities/protective security). With this approach 98,1 % of Mozambican are considered as poor to be compared to the official headcount of 54,7 % of the national household survey 2008/2009 (Vollner 2012). The approach has not yet be downscaled at district level which would have permitted to take into account the development index of the different district in the assessment of poverty.

Indeed in a systematic analysis of the relationships between poverty and water services in Mozambique underlines that there is a strong relationship between poverty and water services (Zita et al. 2012). This study, based on the interview of 1 340 households in 5 provinces (not including the Gaza province) used an international classification of water service quality presented in table 6. This analysis points out that the very poor receive the worst services in term of quantity and accessibility, which in turn aggravate their poverty status.

TABLE 6: WATER SERVICES LEVEL USED BY WASHCOST PROJECT

Service level	Quantity (lpcd)	Quality	Accessibility distance and crowding (minutes per round trip)	Reliability
High	≥ 60 Liters per person per day	Meets or exceeds national norms based on regular testing	Less than 10 min. per round trip. (Or alternatively water available in the compound or HH)	Very reliable = works all the time
Intermediate	≥ 40 Liters per person per day	Acceptable user perception and meets/exceeds national norms based on occasional testing	Between 10 and 30 min. per round trip. (Or alternatively less than 500m from the household AND less normative population per functioning water point)	Reliable/secure = works most of the time
Basic (normative)	≥ 20 Liters per person per day			
Substandard	≥ 5 Liters per person per day	Negative user perception and/or no testing	Between 30 and 60 min. per round trip (Or alternatively between 500m and 1000 meters from the AND/OR more than normative population per functioning water point)	Problematic = Suffers significant breakdowns and slow repairs
No service Improvement	< 5 Liters per person per day	Fails to meet national norms	More than 60 min per round trip. (Or alternatively more than 1000m from the household)	Unreliable/insecure = completely broken down

(source: Washcost project)

POVERTY DRIVERS IN LIVELIHOOD ASSESSMENT: THE ROLE OF HOUSEHOLD ASSETS

As detailed by Magombeyi et al. (2013), the concept of livelihoods (DFID 1999) broadens the understanding of food security beyond the availability of food and instead considers all capabilities, assets and activities required to live. The poverty maps developed Magombeyi et al.

(2013) as part of the CPWF program refers to the FEWSNET monitoring in the upper Limpopo Basin considered as a sensitive food security area in Mozambique. FEWSNET have defined livelihood zones in which wealth groups are being differentiated principally in function of their assets (area cropped, available workforce, cattle and small animal head principally). Table 7 summarizes the main characteristics of this livelihood zones and groups encompassed in Mabalane. These groups were characterized using an first classification by village which was validated and specified by focus group discussion at village level.

TABLE 7: LIVELIHOODS IN THE MABALANE DISTRICT BY FEWNETS

		Riverine zone (MZ36)	Semi-arid maize zone (MZ35)	Charcoal and agriculture (Massingir area) (MZ 37)
Difference between categories		Lowland area [2 ha as limit between group 1-2 & 3-4] Cattle [group 2,3&4] Workforce [4 people as limit between 1-2 & 3-4]	Draught power and equipment [group 3-4] Small animals for poor [2-3-4] and cattle for better off [3-4] workforce	Livestock holding [group 2-3-4] Draught power and equipment [3-4] Workforce [5 working adults as limit between group 1-2 & 3-4] Ha cultivated [2 ha & limit between 1-2 & 3-4]
1- Very poor	% household	30 %	40 %	30 %
	Cash income (MT)	10-17 000	9-12 000	around 15 000
2- poor	% household	22 %	33 %	50 %
	Cash income (MT)	17-25 000	12-17 000	19 000
3- middle	% household	25 %	22 %	20 %
	Cash income (MT)	25-35 000	22-32 000	around 39 000
4- Better off	% household	18 %	18 %	10 %
	Cash income (MT)	35 000-80 000	34-46 000	around 125 000

Source : adapted from Fewsnet, 2011 and Fewnet 2012

According to FEWSNET, Mabalane lies at the confluence of three of the identified zones: the Upper Limpopo riverine zone (MZ36), the Semi-arid Maize Interior (MZ35) and the Upper Charcoal and Agriculture (MZ37) (FEWSNET 2011, 2012). Livelihoods in the latter zone has not been properly characterized (Monteiro, com pers). Charcoal production is currently developing very rapidly in this area (Maússe 2013) so the data from the Massingir livelihood zone (MZ38) where charcoal production is more ancient were used to characterize livelihood in the area. In the Massingir zone the FEWSNET study indicates that poorer households processed between 100 and 180 sacks of charcoal a year, middle produces between 300 sacks a year and the richest one able to hire workforce between 700/900 sacks. In the absence of other data, these numbers are extrapolated to Mabalane.

The three villages studied are all localized in the Riverine zone. As in the FEWSNET study, leaders were asked to group village households in 4 wealth groups (called *Poorest, Poor, Middle and Better-Off* in this report). Non-surprisingly, the wealth determinants of both studies are close. In the three villages, the criteria used by leaders to determine wealth group were: the number of people in the household, the number of cattle heads, the existence of migration remittance or regular income such as small shops or other remunerated activities (bread making etc).

A factorial analysis (annex 7) was undertaken to better understand wealth determination. It underlines that other variables presented in Table 8 that those chosen by leader contribute to

groups differentiation. This analysis notably underlined the importance of tillage equipment, poultry or small animal (goats, sheep, and pigs), the quality of housing (assessed through a score depending of the existence tin roof, electricity panels, cemented wall and/or floor, latrines). The weight of each criterion varies from one village to the other. Surprisingly, cash income criteria (aggregating contribution from remittances, other type of income such as small shop and charcoal making) were not discriminating possibly because the cash income which can significantly vary from one household to the other was not quantitatively assessed in the survey.

TABLE 8: VARIABLES WITH HIGHEST WEIGHT IN THE FACTORIAL ANALYSIS

All village	Village 1	Village 2	Village 3
Cattle head (33 %) Plough and oxen (27 %) House state (22 %) Workforce (15 %)	Oxen and plough (22 %) Cattle head (21 %) Poultry (15 %) Small animal (13 %) Workforce (11 %) House state (10 %)	Cattle heads (37 %) Oxen and plough (31 %) House state (20 %) Workforce (9 %)	House state (25 %) Cattle head (23 %) Area total cropped (22 %) Workforce (11 %) Oxen and plough (9 %)

(source CPWF Mabalane interviews)

Significant differences existed between the poorest groups (group 1 and 2) and the better-off group (group 3 and 4) concerning the **household workforce, poultry and heads of cattle** (Table 9). Other variables were not significantly different or their difference could not be explored as they were qualitative (housing score for example or cash income from other activities).

TABLE 9: QUANTITATIVE VARIABLES WITH SIGNIFICANT DIFFERENCE BETWEEN WEALTH GROUPS IN THE VILLAGES STUDIED IN MABALANE

	Group 1 Poorest	Group 2 Poor	Group 3 Middle	Group 4 Better off
Size of family	6,8 b	7,4 b	12,1 a	11,3 a
Adult work force (> 15 yo)	4,2 b	4,4 b	6,5 a	6,5 a
Work force excluding solarized children and ill person	4,2 b	4,7 b	7,5 a	7,5 a
Work force effective	3,1 b	3,5 b	5,0 a	5,0 a
Children less than 15 Yo	2,6 b	3,0 b	5,6 a	4,7 a
Nb of cattle head without oxen	0,8c	1,7c	8,4b	18,6a
Poultry	2,8b	3,3b	2,8b	5,8a

(source CPWF Mabalane interviews)

Thus wealthier households have larger families (and therefore available workforce), a larger number of dependents, a larger number of cattle and poultry. The *Better-Off* household owned cattle heads in average while *Poorest* households had in average less than one head.

In our survey, differently to the FEWSNET studies, the area cropped was not a direct determinant of wealth. Two reasons may explain it. In the absence of other methods commonly used by farmers and technicians, surface was used by the quantity of maize seeds used, an uncertain estimation. Besides the availability of land and especially flood plains or alluvial

terraces varies in each village depending of local topography. For example, no plots are cropped outside of the floodplain in Village 3 located in the buffer zone of the PNL because of the risks related to wild fauna.

To conclude, it appeared that wealth as perceived by leaders was determined by the capacity of the family to cultivate a large area (that is availability of workforce and tillage equipment and somewhat the area cropped), and the ability to benefit from non-agricultural cash income including charcoal selling. Excess income if any is principally invested in cattle and limited housing improvement. *Better-off* households have also higher mean to take care of their animals and they experienced lower mortality rate and/or higher reproduction rate with evidence in poultry very sensitive to new-castle disease in the area in our survey and goat in FEWSNET study.

But these criteria are not describing the whole variability of household situation: for example some households with cattle are ranked among the *Poor* households or households without cattle are classified as *Better-Offs*. This indicates that poverty goes beyond assets availability and involves other aspects that need to be clarified. One refers to the localization and the other to social relationships.

SPATIAL DIFFERENTIATION OF POVERTY

In rural districts of the Northern Nampula Province poverty is unequally spread in space and territories: communities close to the administrative center have better access to public services and enhanced options for access to everything from quality education to social security benefits "*Households with rural urban relationships are also better positioned to pursue a strategy of exploiting both types of settings*". (Tvedten et al. 2010).

This spatial differential is also visible in Mabalane and is acknowledged by the administration. The PEDD 2010 thus underlines the difference of poverty indicators between the administrative posts of the district (Table 10).

TABLE 10: ESTIMATION OF POVERTY AND INEQUALITY IN MABALANE DISTRICT (PEDD, 2012)

Administrative Post	Poverty incidence	Depth of poverty	Severity of poverty	Nb. poor	Allocation proportion	Population (census 97)
Mabalane	0,55	0,22	0,12	5.321	0,05	10.048
Combomune	0,80	0,38	0,22	6.581	0,07	8.403
Ntlavene	0,88	0,43	0,25	5.882	0,07	7.013
Global	**0,72**	**0,33**	**0,19**	**17.784**	**0,18**	**25.464**

Source: adapted from the study on the disaggregation of the poverty indicators of MPD (2002) out of Mabalane PEDD (2010)

Indeed, water services were unequally developed as underlined in table 11 which presents the water point situation **prior** to the PRONASAR intervention. The two railways villages or *vilas* (Mabalane-sede and Combumune-Estação) were inadequately deserved: There was no operational water system in Mabalane-Sede but five small-systems in Combumune-Estação. Villages located on the right margin in the surrounding of Mabalane-Sede or in the southern part (closer to the tarred road and main city center of Chókwè (called "close river villages") were better equipped than villages located in other area notably in Plateau area or in the PNL buffer zone. These data confirm the overall impression of inequitable development when visiting the

districts with more developed riverine villages than Plateau or LNP Buffer Zone villages. Data are however missing to better characterize the differences between zones.

TABLE 11: REPARTITION OF WATER POINTS (WP) IN THE MAIN ZONE OF MABALANE DISTRICT PRIOR THE PRONASAR INTERVENTION

	% wp** / total	% op wp /total	% households/op wp	% wp / village	% op wp / village
Vilas*	9 %	5 %	1 120	3,0	1,0
Close river villages	28 %	29 %	167	1,5	1,0
Others river villages	17 %	21 %	203	1,4	1,1
Plateau villages	29 %	26 %	158	0,9	0,5
Buffer zone villages	20 %	19 %	368	0,6	0,4
TOTAL	100%	100%	256	1,0	0,7

*** Mabalane-sede and Combumume-Estação. **wp: water points (boreholes, small water systems). Do not include reservoirs and wells; op wp: operational water points"**
source: CPWF study using Mabalane PRONASAR data,

SOCIAL RELATIONSHIPS AND POVERTY

According to Tvedten (2010), although lack of income is the main driver of poverty as the ability to meet basic needs (*food, clothing and shelter)* poverty is also characterized (i) by *sense of voicelessness and powerlessness in relation to institutions of society and the state (alleviated though increased empowerment); and (ii) vulnerability to adverse shocks, linked with the ability to cope with them though social relationships and legal institutions (alleviated though increased security)*. He further adds that '*poor people will eventually become less powerless and vulnerable in their relations with their extended family, the community and the state with improved material conditions'.* He points out that the general name for poverty in Ronga/Shangana is "*xisiwana*", which means "somebody who has nothing" or alternatively "people who are afraid to talk to other people" or "infertile land" – emphasizing the dual attribute of material poverty and social isolation.

In rural villages of semi-arid southern Mozambique the development of formal relationships with administration and external aid plays a key role to cope with drought (Osbahr et al. 2008). It permits villages elites and traditional leaderships to act on opportunities with external institutions. This strategy is highlighted as particularly important for those who have biggest herds: they use their links outside of the community to get access to information, medicine and advices. According to this author, participation in association also are playing a role in gender equality allowing women to get access to land, extra labor and information.

In the three villages studied, responsibilities at village level were assumed by households from different wealth groups but were more frequent in the groups "*Middle*" and "*Poor*" (Table 12) that is the average income group.

Three types of responsibilities were differentiated: (i) Type 3 responsibility when household head assume an official leadership charge (traditional or elected) (ii) Type 2 responsibility when household head is a block chief or a leader's adviser, a member of the government dominant party or he or his wife practice traditional medicine (iii) Type 1 responsibility when

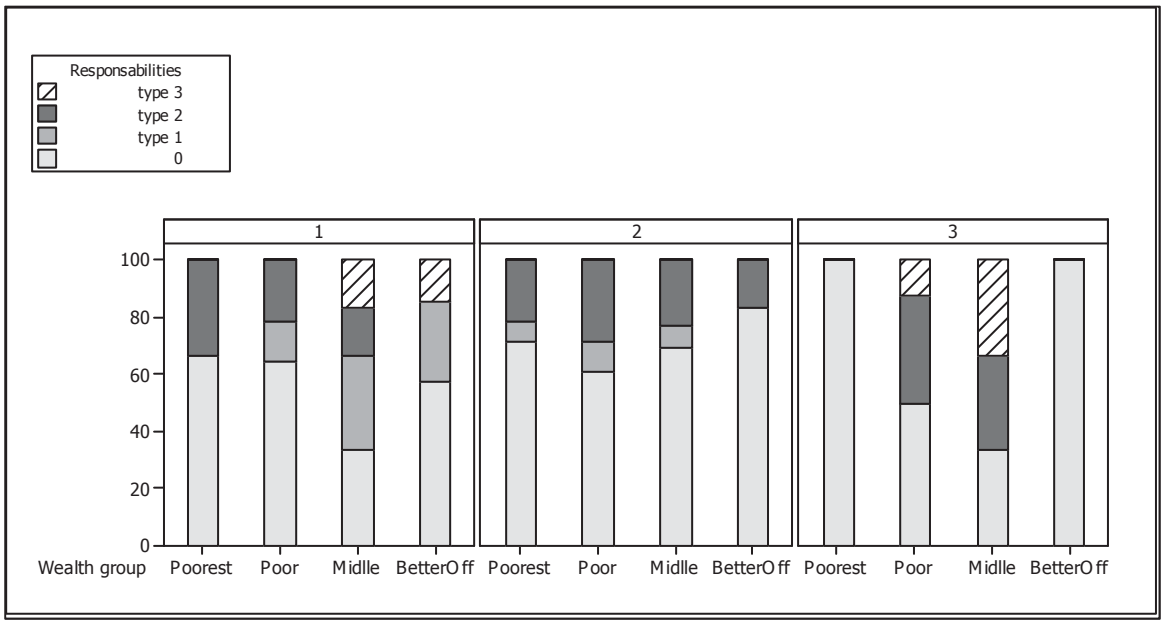
ascendant or descendant of the household head practices traditional medicine, is an adviser or a party member or if the household head's wife is a member of the party.

TABLE 12: PERCENTAGE OF HOUSEHOLD BY WEALTH GROUP WITH COMMUNITY RESPONSIBILITY

Wealth group	No responsibility	type 1 (household member)	type 2 (adviser charge, party member)	type 3 (official leadership)
Poorest	72%	4%	24%	0%
Poor	60%	10%	28%	2%
Middle	55%	14%	23%	9%
Better-Off	77%	9%	9%	5%
Total	**65%**	**9%**	**23%**	**3%**

Source: CPWF Mabalane interviews

FIGURE 1: RESPONSIBILITY IN THE HOUSEHOLD BY WEALTH GROUP IN EACH VILLAGE



Leadership position were principally hold by household from the two highest income groups Overall the *Better-Off* and *Poorest* households appeared to be less likely to assume village responsibilities while nearly one household out of two in the Middle Group household assumed some type of responsibilities. Interestingly *Better-off* households tended to have less secondary responsibilities (advisers, traditional medicine, party members) than other type households; secondary or primary responsibilities (such as advisors, party membership or traditional medicine) could be entrusted to households from the *Poorest* groups. This suggests that other criteria than wealth presides to the involvement in community life and/or that *Poorest* households may not have the abilities or opportunities to make the most of the opportunities offered by their position as other more wealthy households. Yet, this varies however depending of villages (Figure 1).

Position can provide opportunities for improved material conditions but it appeared to be relatively limited either because villagers are reluctant to provide too much power to the *Better-Off* or because *Better-Off* households prefer engaging their time in other (more lucrative) activities rather than villages responsibilities.

Social relationships in rural households of southern Mozambique also mobilize exchange relationships within the community, defined by Brouwer as *institutional arrangement that organize the sharing of foods, goods or animal draught and organize saving and credit (Brouwer 2006)*. The same form of mutual aid exchanges are found in all Mozambique under different names (Vuma 2004). Social connections are maintained through traditional gift system in order to ensure future reciprocity (Osbahr et al., 2008). They allow households to cope with occasional labor shortage by reciprocating small gifts or food. Strong cultural norms exists regarding reciprocity of labor exchange but it requires availability of workforce: female headed, small household and elderly are particularly dependent on their social network but are those who have the more difficulties in returning gifts and labors. Consequently the effectiveness of these typed of mechanisms for the most vulnerable households which are also labor short are limited. These mechanisms have moreover been evolving recently with a shift to cash payment for gaining access to labor. For example *Matsoni (*informal labor exchange between women*)* are reported to have evolved from an informal exchange base to more formal one according to (Brouwers 2006).

As the name changed between local and the arrangement evolved around time it is difficult to find a common definition of the different form of mutual aid in the area. Annex 2 synthetizes the main forms of mutual help as presented in the literature. The description retained in Table 13 is the local description given by farmers to the interviewers. Five different forms of exchanges were identified but only one of them involved money (*Kurimela/Kurimelissa*) which could be related to the limited village monetization.

TABLE 13: TYPES OF COMMUNITIES INTERACTIONS IDENTIFIED IN THE 3 VILLAGES STUDIED

Name	Kupfunana	Matsimu	Kukashela Kukashelissa	Kurimela Kurimelissa	Xikoropa
Type of exchange	Labor exchange between family; use for charcoal making (occasional)	Labor for weeding during rainy season against alcohol drink (occasional)	Lending of a pair of oxen for plowing in exchange of plowing the plot of the oxen owner (regular)	Working in the plot of other in exchange of money (occasional)	Regular Working in the plot of other in exchange of soap (regular)
Practiced in	Village 1	Village 1 Village 2 Village 3	Village 1 Village 2 Village 3	Village 2	Village 2
% hh indicating occasional use	9 %	35 %	18 %	25 %	17 %
% hh indicating regular use	5 %	5 %	31 %	11 %	4 %

(source CPWF Mabalane interviews)

FIGURE 2: PROPORTION OF HOUSEHOLDS BY WEALTH GROUP INDICATING HAVING USED TYPE OF MUTUAL HELP EXCHANGE ON AN OCCASIONAL BASIS

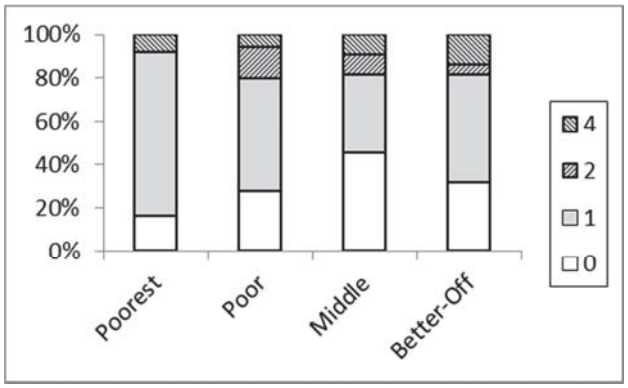
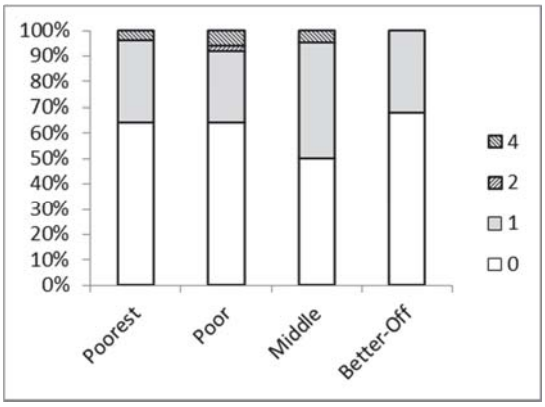


FIGURE 3: PROPORTION OF HOUSEHOLDS IN WEALTH GROUPS INDICATING HAVING USED SOME TYPE OF MUTUAL HELP EXCHANGE ON A REGULAR BASIS



They are more a kind of solidarity mechanism allowing poor household to cope with occasional labor shortage or specific problem than a real safety net: Participation in occasional mutual exchanges (principally *Matsimo*, occasional weeding work in exchange of gift – for example alcoholic drink - and *Kurimela/kurimeliss,* working in other's plot in exchange of money) increased in the lower wealth group (Figure 2) and seventy one percent of all interviewees reported having used occasional mutual exchanges; Yet only thirty eight percent did it on a regular basis, mostly *Kukashela/kukashelissa* that is the exchange of workday against tillage equipment the main way by which under-equipped household get their *machamba* ploughed.

CONCLUSION: THE POOREST AS THE MORE DEPENDENT OF NATURAL RESOURCES AND THE LEAST ABLE TO MAKE USE OF IT

In Mozambique rural areas tend to concentrate a large part of poverty. Although official data indicates that poverty is decreasing, the Mabalane district is one of the districts of the Southern area where poverty remain prevalent even it is not the worst district of the upper Limpopo Basin. In any case, wealth accumulation in this rural district remains limited: in average the *Better-Off* in our sample owned in less than 20 head of cattle and villages are characterized by limited monetization..

Poverty is characterized by the lack of assets notably labor availability and tillage equipment to exploit the natural resources (water, land, forest, pasture, and biodiversity) and make use of economic opportunities. These resources are not equally spread on the territory; Past development strategies has contributed to the emergence of pocket of poverty where lack of assets and underdeveloped public service increased poverty level. This was the case of Plateau areas where irregular rainfall makes agriculture hazardous although we were not able to precisely quantify the difference between ecosystem zone.

Yet poor households are integrated in village functioning and can assume some responsibilities even if households from the most extreme group (*Better-Off* or *Poorest*) are less likely to assume a role of advisors at village level.

ADDRESSING POVERTY AT COMMUNITY LEVEL

Targeting the poorest

As in the whole Limpopo basin (Magombeyi et al. 2013), the most vulnerable people at policy and village level are children headed household, women headed household with large number of dependent, disabled people or older. This is well acknowledged and mentioned in different policies. But on paper, only few project/program have explicit and well defined pro-poor activities. These are the case of some INAS programs, post flood relief actions and the PRONASAR program.

The INAS interventions

INAS is in charge of the development of social security program and activities in relation with absolute poverty alleviation, among which basic social direct subsidies, direct support to older people and orphans, assistance to disabled people, and food security program based on Food-for-Work schemes (Annex 3). In 2008 as reported in Mabalane PEDD, their interventions reached approximately 200 people. NGOs intervening in the district also supported 660 children orphaned with first necessity and scholar material by NGOs (PEDD 2012).

TABLE 14: INAS INTERVENTIONS IN 2009 IN MABALANE

Programa	Beneficiaries			Observation
	Total	Men	Women	
Food subsidies	174	47	127	
Work social benefit (BST)	17	0	17	Head of family
Nutrition rehabilitation	42			Under nourished children
Integration in associations	62	0	62	
Integration in Project	18			

Source: PEDD 2010 (SDSMAS, Mabalane 2008)

The mode of intervention of INAS has changed in 2011/2012. In the past, there used to directly support the development of income generating activities by subsidizing equipment or capital to associations; INAS also supported the building of institutions to manage the equipment (for example association for small irrigation project). The activities of the associations were supposed to be supported by district technical services. This strategy was assessed to be inefficient, which was attributed to an insufficient accompaniment by technical services and delays in implementation process.

The number of people reached has been increasing in recent years. In 2012, basic social direct subsidies concerned 718 households (13 % of the District households) which received between 130 and 380 MT monthly depending on the number of dependents. The program provides such a secure monthly income even if small to a very limited number of families; There is no direct links with water. Eight villages were selected jointly with the district administration, all of them located on the right bank of the river and mostly in the Mabalane Administrative Post (the post closest to Chókwè where INAS correspondent is based). This subsidies target mostly elders people (in particular widows), women head of families with a large number of dependents and head of family with chronic disease (HIV).

Since 2012 a new pilot program supported by PMIA and World Bank has been implemented in 11 communities of the district (Right bank of the Limpopo River mostly, as well as Mabalane-Vila and Combomune-Estação). This program which lies on a Food-for-Work scheme aims to provide food to selected members of the communities against the development of activities of common interest for the community. NGOs are expected to help communities to propose and submit projects. Two types of project could have direct links with water: building or maintenance of small reservoirs and production of bricks. Yet at this stage only one or two projects (road maintenance) had been initiated in this district. Most projects proposed related to road maintenance, the fruit tree or tuber crops (sweet potatoes, cassava) plantation. It is worth noting that small reservoirs rehabilitation had been sponsored by INAS under Food-for-Work schemes in a couple of village as part of drought relief interventions.

For the first type of intervention, the leader of each selected village indicates a "*permanent*" who is in charge of establishing the list of beneficiaries. This "*permanent*" who receives a 500 MT monthly (17 USD) stipend should be a respected member of the community. Beneficiary should be over 55 years old if a woman and 60 years if a man, should have no external cash income and no cattle. The selection list is then validated by the technical team of INAS by homestead visit. Occasionally, as mentioned by INAS, discrepancy between the population targeted and the population selected are corrected during this validation visit. The Food-For-Work program follows a more traditional selection approach with a community information and consultation and establishment of the list of participants by community leader.

Post flood emergency programs

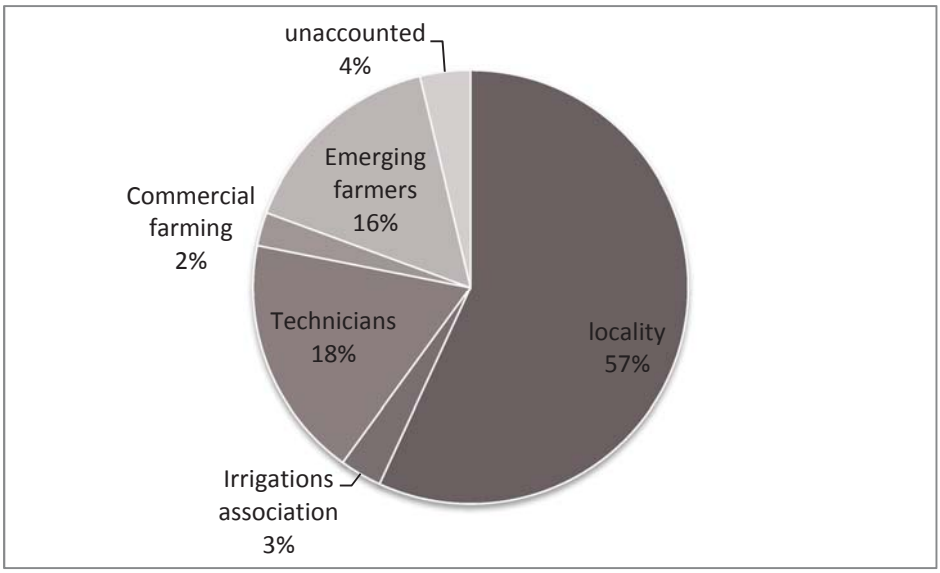
Emergency programs also have pro-poor explicit mechanisms. This was the case of the post January 2013 flood relief emergency program. In Mabalane, the flood wave destroyed all the crops located in the alluvial terraces, carried away equipment left in the area (including moto-pumps but most of them were recuperated) and drowned a few isolated animals. Sand deposit did also sterilize some area but focus-group underlined that flood is not necessarily viewed as a negative event as it also increases soil fertility and soil humidity, permitting to develop the productive flood recession crops on large area. Actually 2013 crop was considered as the best agricultural year of the last decade.

Villages which are all located in higher ground were not affected but villagers lost their first crop which is very important at this time of the year (hungry gap period). They also had limited available seeds to develop flood recession crops. In coordination with INGC, NGOs that wished to be involved in post-flood relief interventions were allocated a target district. The approach retained were the same for all involved NGOs. They would provide subsidy to a target population in the form of vouchers that recipients could spent in an agriculture fair organized by the NGO; The fair should proposed a large range of items so that recipient could choose between different types of products (seeds, small equipment, fertilizers etc). The NGO "Save the Children" was in charge of the intervention in Mabalane and provided a voucher of 1500 MT to 2000 beneficiaries in 37 communities (**all** riverine villages). SDAE was in charge of implementing the fair and a local team was subcontracted to organize the census of beneficiaries following their indication. The target was the "most vulnerable" and "most impacted by the flood" but this aspects were not very well defined. It included orphans children, households headed by children, poorest families (assessed trough house state), household with chronic diseased members, old people with little assets and households that had lost everything during the flood. This list was supposed to be controlled by a random control over 10 % of recipient after the process by the NGO;

In practice the local team did not have transport mean to access the village (they were supposed to use technical services car) then lacked time to proceed to the selection and in two third of the villages the list was elaborated by the leader. The final control was not implemented. This approach resulted in confusion and resentment. In one village visited after the operation, the leader admitted he divided the village households in three groups and one third of people were selected independently of their vulnerability situation. The engagement was that that if another program was undertaken another third of the population would be selected.

The government also distributed maize seeds through the agricultural services and the distribution was left to the discretion of the technical services. The allocation in Mabalane is presented in the following graph.

FIGURE 4: ALLOCATION OF MAIZE SEEDS RECEIVED FROM THE GOVERNEMENT IN THE POST-FLOOD EMERGENCY



Source: Mabalane SDAE document 2013

Seeds allocated to locality were supposed to be distributed in the different villages of the locality through village leadership. Emerging farmers (also called private farmers) received 16 % of the total amount of seeds and (SDAE) technicians 18 %. Quantity of seeds distributed to private farmers and association depended of the surface cultivated. In average private farmers received 29 kg of seed while irrigation association received 25 kg.

If more than half of the seed was allocated to locality and indirectly to small scale and subsistence farmers, the quantity received by family was insignificant. Seeds were distributed both in riverine villages (which did suffer from the flood) and plateau villages (unattained). Seeds distribution was thus not so much a post-flood operation than a government intervention for rural. If all families of the locality villages received seeds, the quantity received was in average of 0,5 kg per family (Table 15) to be compared to the normative seed density (25 kg/ which can go as low as 15 kg/ha in extensive system and up to 30 kg/ha in more intensive system): the quantity of seed received by subsistence and small scale farmers was very small if an equitative distribution system was retained.

TABLE 15: MAIZE SEEDS ALLOCATION BY LOCALITY IN THE GOVERNEMENT POS FLOOD PROGRAM

	Posto	Locality	Kg	Kg / family
Riverine area	Mabalane	Mabalane Sede	900	0,90
		Tsocate	800	0,47
	Combumune	Combumune Rio	700	0,33
	Ntlavene	Chinpwonpwse	750	0,75
		Ntlavene (Buffer zone)	750	0,45
Total Riverine area			*3900*	*0,52*
Plateau	Mabalane	Nhatimanba	300	0,38
	Combumune	Combumune Estação	350	0,45
Total Plateau area			*650*	*0,42*
TOTAL MABALANE			**4550**	**0,50**

Source: SDAE document 2013; families by village: Pronasar data

In practice targeted intervention have mixed outcomes

The number of beneficiaries of "business as usual" program underlined the unequal intervention of INAS in the different villages (table 16). Only a few villages were "serviced" in the past and Village 1 was obviously one of these. Yet nearly two third of the households have at one time or another beneficiated from some kind of Food-for-Work intervention, the main intervention strategy during drought events in the past. The last major drought was in 2006/2007.

TABLE 16: BENEFICIARIES IN EACH VILLAGE OF INAS INTERVENTION AND FDD SCHEMES

	Village1	Village2	Village3	All villages
Number beneficiaries FDD	1	1	0	
% households that has been involved in Food For Work project	69 %	55 %	63 %	61 %
% households that has already received an INAS support	19 %	1 %	6 %	8 %

Source: CPWF IWEGA study

The percentage of recipients of INAS programs increased with decreasing wealth group (Figure 5). Indeed, poorest households were more likely to have received a support from pro-poor government program (INAS or flood relief intervention) than wealthier households. Yet 50 % of the richest wealth groups profited from a Food-for-Work intervention, whose conditions of access in time of drought have not been explored. The graph underlines clearly that even if targeted subsidies reached a higher percentage of poorest households, richest households had also access these mechanisms. If these interventions managed globally to reach their target, the better-off of the communities had clearly the means to get hold over part of it.

Yet the percentage of poorest household reached by these programs varied from village to village (Figure 6). In Village 3 for example the Food-For-Work interventions did reach exclusively the poorest households of the community according to our sample while in Village 1 it was spread among all wealth groups with a small advantage for the poorest group. This underlines the role of village leadership in access to the targeted population.

FIGURE 5: PERCENTAGE OF RECIPIENTS OF THE GOUVERNMENT PROPOOR PROGRAM BY WEALTH GROUPS

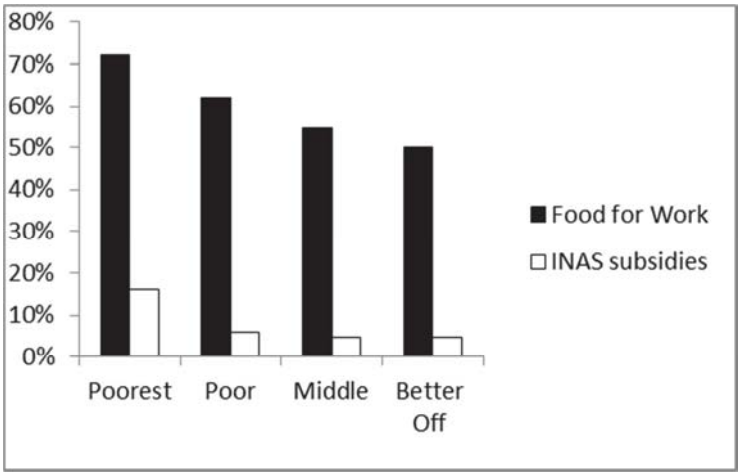
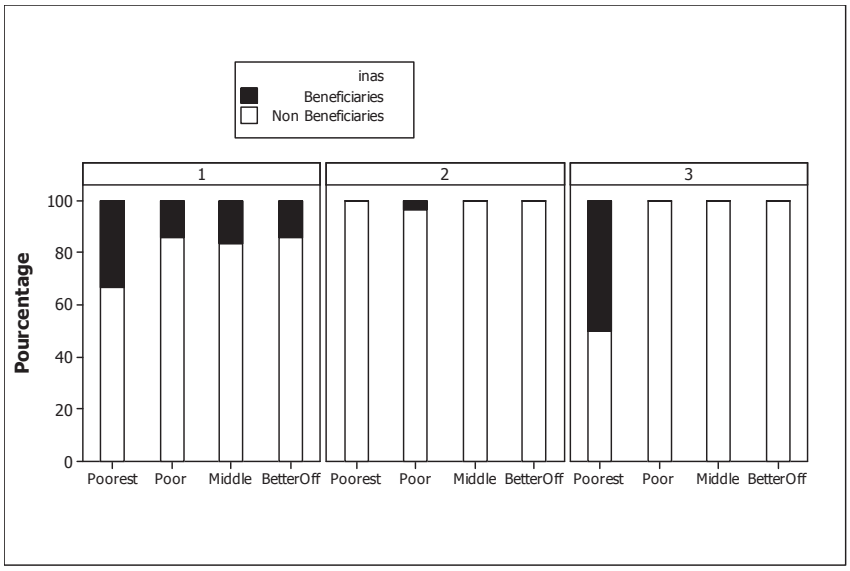


FIGURE 6: PERCENTAGE OF RECIPIENTS OF INAS SUBSIDIES BY VILLAGE



Overall, almost all (92 %) households of this riverine villages lost crops due to the flood and 74 % also lost small equipment. In village 3 all interviewees reported having lost equipment which may be due to the geomorphology of the area: the alluvial terrace where the plots are located is quite distant to the village, so farmers keep their equipment on the field. Village 1 has lost relatively less equipment (64 %) than other villages. Only 4 % of households lost animals. The perception of flood however was globally positive: 63 % of our sample considered that the 2013 flood had mostly a positive impact. This is notably the case of Village 1 where 75 % of the interviewees had a positive perception of the flood. It was notably assessed as positive for fertility for 71 % of the interviewees. This perception was globally shared between wealth groups but it differed slightly between villages: 88 % in Village 1, 73 % in Village 2 and 58 % in Village 3 had a positive view of the evolution of fertility. These differences could result from the different geomorphology of village territory which determines alluvial deposits. The

discrepancies between flood loss and flood perception can be explain by the role of flood in livelihood: In these riverine villages flood recession crops are more secure than rain-fed crops. Flood is not necessarily associated to heavy rainfall has it is mostly related to upstream management and rainfall in the catchment consequently while flood allows for the development of extensive area of flood recession crop system, harvest may remain limited in the Plateau area.

Perception of the flood did not really vary according to wealth group although *Poorest* people tended to be a little less positive as underlined in figure 7. But flood risk was clearly unequally imposed on households and *Poorest* household tended to have proportionally lost more equipment than *Better-off* households (figure 8) in spite of their being less well equipped. .

FIGURE 7: PERCEPTION OF THE FLOOD DEPENDING OF WEALTH GROUPS

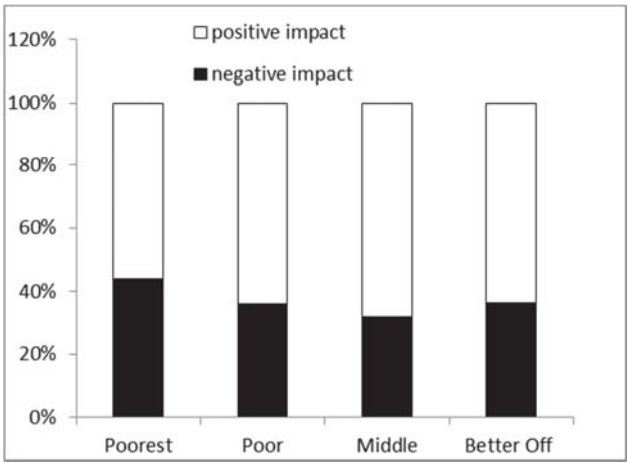


FIGURE 8: EQUIPMENT LOSS DEPENDING OF WEALTH GROUPS

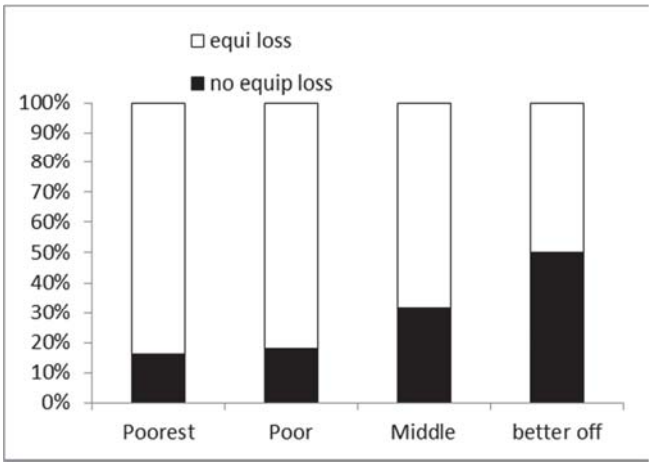


Table 16 underlines the contribution of government or NGO support in households after the 2013 flood. In each village more than 2/3 of households received one or the other type of help. The mechanisms of government aid distribution resulted in a very limited support to small scale farmer and most beneficiaries reported receiving only one unit maize seed (allowing to sow less than a third of ha) and sometimes some equipment (hoe, bucket, machete). One unit is normally a 5 kg bag of maize which would on a basis of 3900 kg of seeds distributed in the riverine village cover 780 families that is 10 % of the total number of families registered in the PRONASAR data base. With an average of 64 % of families covered as indicated by this study the average quantity of seeds received in the riverine villages would have been 0,8 kg of seed allowing to sow a maximum of 50 m^2.

A minority of households also resorted to other types of aids (e.g extra money from migrants, extra migration) although this was proportionally more important in Village 1 than in others. Most households received external support either in the form of seeds or vouchers, but a majority received either one OR the other type of support.

TABLE 17: PERCENTAGE OF HOUSEHOLDS RECEIVING SPECIFIC HELP AFTER THE 2013 FLOOD

	Seed and small equip	Vouchers (Save the Children)	Extra money from family	Extra Migration	Other help	Non government or NGO support	Gov or NGO support
Village 1	56 %	42 %	3 %	6 %	22 %	31 %	69 %
Village 2	64 %	54 %	1 %	3 %	6 %	12 %	85 %
Village 3	81 %	63 %	6 %	0 %	6 %	12%	100 %
Total	64 %	52 %	3%	3 %	11 %	18 %	82 %

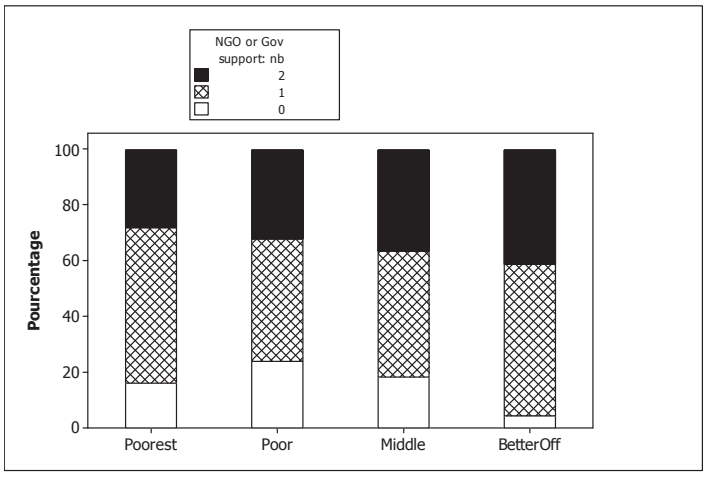
But the official assistance was not equally allocated between wealth group; ***Better-off* people tended to receive more support than other groups** (table 18, figure 9 and 10). This was particularly the case of government support which used the traditional pathway (technical services and leaderships). The voucher system profited equally to all wealth groups although *Poorest* people were targeted. Not surprisingly the *Better-off* were also best able to mobilize the non-official types of help. This group were also the most likely to receive government or/and NGO support even with intervention targeting specifically the most vulnerable (figure 9) and more clearly they were most likely to cumulate d different types of (official) help.

TABLE 18: PERCENTAGE OF HOUSEHOLD BY WEALTH GROUP RECEIVING HELP AFTER THE 2013 FLOOD

	Seed and small equipment	Vouchers	Individual support	Government or NGO support
Poorest	60 %	52 %	16 %	84 %
Poor	56 %	52 %	18 %	76 %
Middle	63 %	54 %	13 %	81 %
Better Off	83 %	50 %	22%	95 %

Source CPWF survey

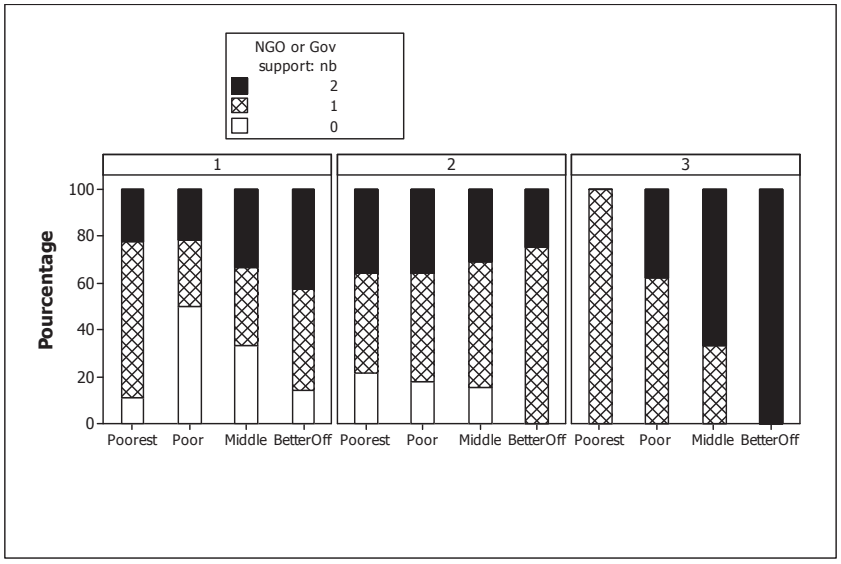
FIGURE 9: NB OF SUPPORT POSTFLOOD SITUATION FROM NGO OR GOUVERNEMENT RECEIVED BY WEALTH GROUP



Yet, although they had less chance to cumulate supports, an equal number or even a slightly more households of the *Poorest* groups received emergency aid compared to the *Poor* and *Middle* wealth group. This indicates that even if the aid did not exclusively attain the "*Poorest* group" target, it did it partially.

As for the INAS program the efficiency in reaching the poorest households varies according of villages (figure 6). This underlines the role of leaderships in the selection of targeted recipients.

FIGURE 10: PERCENTAGE OF HOUSEHOLDS IN EACH WEALTH GROUP AND NUMBER OF INTERVENTIONS IN THE THREE VILLAGES



In conclusion, the *Poorest* households had globally less chance to have access to external help than wealthier households. The mechanisms of allocation of government post flood program resulted in insignificant contribution at family level except for emerging farmers and technicians. At village level they tended to profit more the wealthier families. The unequal access is partially balanced by explicit pro-poor targeted programs although these programs are not void of local elite capture. In any case the proportion of wealthier households that seized intervention varied in the three villages which draws attention to social functioning at community level and gatekeeping role of leadership.

Village leadership(s) as gatekeepers to the community

Leadership is perceived as the representative of the communities to the administration and the interface or linking agents between communities and administration (see Annex 4). In practice their role is more complex: At local level the administration is being represented by a civil servant appointed by the government or "locality chief" (*Chefe de Localidade*). His home is in a locality village which "controls" various communities. All communities in a locality elect a 1st scale leader to represent them at locality level. At village or community level a 2nd scale leader is elected to represent village members. New election can be organized if the leaders choose to resign (to migrate for example) or in case of death but there are no periodic reelection. Communities have also a traditional leader which inherits his responsibilities and is in charge of traditional ceremonies and land allocation. He holds generally the title of 3rd scale leader although in some cases due to the grouping of village in the 70"s (*Vilagização*), a given

community may have a couple of traditional leaders among which one is selected to be the 3rd scale leader in title.

Responsibilities and decision making varies in each villages depending of the relationships between the leaders, including their age, families ties and historical backgrounds (Box 2)

Village A: The 3rd scale leader is the young elder son of the former 3rd scale leaders but he refers to a council of older men of his (extended) family for any decision concerning land; Land attribution is then confirmed and officially validated by the 2nd scale leader who is his uncle.

Village B: The strong older 3rd scale leader with well recognized power keep a stronghold on the community, while the young 2nd scale leaders seems to have a mere role of interface with the government structures.

BOX 2: EXAMPLE OR ROLES AND RELATIONSHIPS BETWEEN LEADERS

Each leader has his own set of advisors. Interestingly in some villages the words to design the set of advisors are not the same: elected leader had *conselheiros* (Portuguese word for advisers) while traditional leaders had *Indunas* (Changana word for adviser). Other sets of responsibilities in the village includes the block and sub-block chief which used to be party related as well as community police. The Frelimo party also has his own local representation and membership. Project and interventions also creates their own ad-hoc committees (water committee, irrigation committee, hygiene committee etc). In practices the different responsibilities are blurred, depending of villages, one person holding various titles or title being mixed (for example adviser council in one village gathering only block chief but this can be different from one village to the other). In some village our focus group also underlined a hierarchical structure of women representation but this does not seems to be institutionalized or found in all villages.

Leaders play a key interface role between the community and the external "world". They are notably in charge of disseminating (official) information notably concerning external interventions and organizing ad-hoc committees. Members of ad-hoc committees tend to be selected in the inner circle of leaders' "advisers" (*Indunas*, advisers, party members, chief block) but this is not exclusive: In this patriarchal society, only older women (after child carrying age) are normally entitled to speak in the same way as men do. Yet, for some role (water for example) women can be selected according of their skills (writing and reading) and reputation; The 2nd scale leader in one village was a woman..

Focus groups and interviews underlined that project/program information is often circulated only within the first circle of committee members and leaders' advisers (see Box 3) and not beyond but this depends of village and leaders and types of interventions. Operations that have direct economic potential compared to public services interventions are particularly at risk of not being well circulated.

BOX 3: EXAMPLE OF RELATIONSHIPS BETWEEN LEADERING FAMILIES, ADVISERS IN THE CONTEXT OF EXTERNAL INTERVENTION

In Village N, the leadership of the 2nd scale leader is contested, as acknowledged by himself and other interviews. The 3rd scale leader authority does not seem being questioned.

The village conflicts have been fueled by external top down interventions of the last years:

In 2009/2010 the government (INAS) initiated a multi-dimensional intervention in this village including an irrigated scheme of 20 ha, a school, aquaculture and cattle breeding. The villagers were not consulted and they were just informed that the village had been selected. Only three components were initiated: the rehabilitation of the school, the irrigated scheme and the cattle breeding scheme. None of these components have yet been finalized.

Initially the scheme aimed to benefit 50 villagers. INAS would fund the power-pump but the village has to clear and fence the cropping area. Ten villagers would also receive goats but would commit to give the offspring to another family the following year. Family has to choose between one or the other option. The governor (Province level) was to visit the district in 2010 so the district government decided to accelerate the development of the scheme by giving fuel for pumping, seeds and money for the fencing and fertilizers. It was also decided to prepare only 10 ha to be sure to be ready for visit of the governor. The rest of the scheme would be developed latter. Due to area reduction only 20 villagers were included in the association instead of 50. The selection was based on a first come first served basis. The 3rd scale leader donated the land against the promise that he would receive twice the surface of other member, a condition agreed by the government but later on recused by the association. He then left the association.

This first (demonstration) year was satisfactory but the association did not have enough fuel for the second campaign so irrigators were requested to contribute in cash. The number of irrigators dropped down. Support from the agricultural service dropped after the governor visit. The last campaign was even worse and only a small number of persons mobilized to crop this season. They were also transparency issues and a new election was carried out. The 2nd scale leader family claims that his wife received the highest number of vote but the village could not let women be the president so she was only assigned the role of secretary while a young adviser was elected president. They defend two separate view of the scheme: While the secretary support individual activities in the scheme the president defend the initial model of collective cropping.

In 2012, LUPA intervened in the village to regularize the communal forest - inclusively securing private forested area for the leaders of the village as they claim to be entitled by the land regulation. It also included a support for the irrigation scheme including regularization, gift of plants and a support to get credit. A request for credit was elaborated on an individual basis (secretary's position) while the president wanted the credit to be requested in the name of the association. Only a small number of irrigators (6) were included to the credit request and other members of the association has not been informed or associated to the demand. Focus group discussion underlined that only the inner circle of adhoc committee were informed about the credit demand and gift made by the NGO.

Consequently holding a community responsibilities favor access to external interventions even when they have explicit target. Intervention with explicit target help to minimize a too obvious appropriation by the inner leading circle but do not entirely avoids it as underlined in the following figures 11 and 12. These graphs also underline that party membership[8] was important to get access to external interventions at village level in this area which remains the stronghold of the Frelimo party at national level.

[8] **The relationship between party membership and advisers circle has not been investigated**

FIGURE 11: NUMBER OF POST FLOOD SUPPORT RECEIVED DEPENDING ON RESPONSIBILITIES IN THE HOUSEHOLD

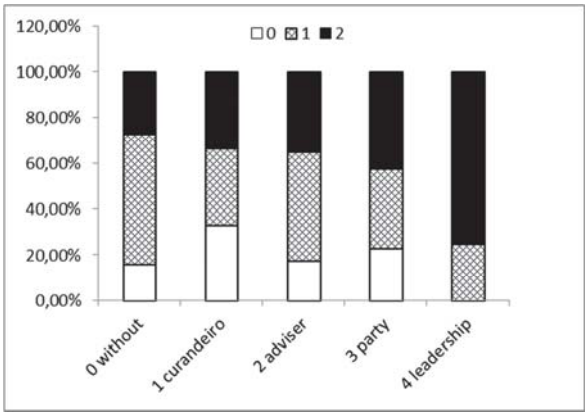
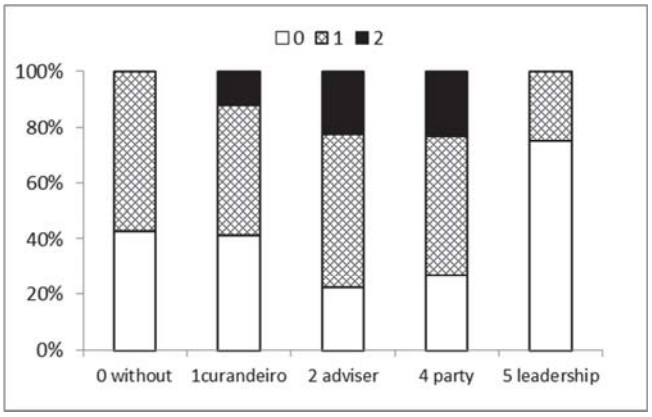


FIGURE 12: NUMBER OF GOVERNMENT PROGRAM RECEIVED DEPENDING ON RESPONSIBILITIES IN THE HOUSEHOLD



Source: CPWF-IWEGA interviews; "Adviser" include adh'oc committee position

In conclusion, as the official interface between the community and external world, all intervention relies on the 2nd scale leader for dissemination of information and communication. The strong top down state functioning favors a top down information circulation rather than a two-way form of information. Participation in adh'oc committee created by external interventions to represent the communities voices and perspectives is often blurred with traditional villages responsibilities although not exclusively. Flow of information outside of the inner circle of village elite depends on leadership style, the relationships with leader' challengers and/or traditional leaders. Traditional leaders keep an important role but their effective power varies village from village according to the complex arrangements between inherited (traditional) leadership and elected leaders, the respective advisors of the different leaders and ad-hoc committee created by external intervention. Because of this functioning village leadership plays often more a role of gatekeeper to the communities than of representation of the community, even if some leaders are accountable to their community and trusted. Entry strategies and implementation pathways of external intervention play a key role in maintaining community cohesiveness and trust. Any existing tensions will be amplified through non-transparent or poorly accountable external intervention that erodes community trust.

THE AMBIGUITY OF THE FDD MECHANISMS AS A POVERTY ALLEVIATION SCHEME

Only two households in our sample declared having beneficiated of FDD funding: this gives an indication of the very limited impact of this scheme at community level (table 15 page 23).

FDD scheme is being presented as a poverty alleviation mechanism, permitting to develop income generating project. As reported by Forquilha (2001) and CIP, as in other districts the rules for project attribution have been progressively realigned to focus on individual project dealing with food production, agriculture or income generation – by opposition of collective

infrastructure for district and village level. Better specification of rules has also led to limit project size and increase the pressure for repayment of the loan.

Three round of payments have been undertaken (2010, 2012 and 2013) which are presented in table 18, 19 and 20.

TABLE 19: OIIL PROJECTS , 2011 ROUND

	Mabalane-Sede	Ntlavene	Combumune
Total amount allocated (including 5 % interest) (MT)	**2 563 010**	**2 393 555**	**(1 880 795) (partial datas)**
Nb of project	**28**	**18**	**(19)**
Project types			
Agriculture food production	4	9	3
Animal breeding	11	5	2 (?)
fishing		1	
Small Industry and carpentery	1		
Agro-processing business	2		
Commerce/small business	8	3	13
Tourism	1		

TABLE 20: OIIL PROJECTS , 2012 ROUND

	Mabalane-Sede	Ntlavene	Combumune	Total
Total amount allocated (MT)	**1 441 826**	**1 272 335**	**1 154 488**	**3 868 649**
Nb of project	**12**	**16**	**14**	**42**
Project types				
Agriculture food production	2	1		3
Animal breeding	5	12	7	24
fishing	1			
Small Industry and carpentry		1		1
Agro-processing business				
Commerce/small business	4	2	7	13
Tourism				

TABLE 21: OIIL PROJECTS 2013 ROUND

	Mabalane-Sede	Ntlavene	Combumune	Total
Total amount allocated (MT)	**1 967 383**	**666 150**	**1 235 000**	**3 868 533**
Nb of project	**17**	**6**	**11**	**34**
Project types				
Agriculture food production	7	2	2	11
Animal breeding	7	3	2	12
fishing				
Small Industry and carpentry				
Agro-processing business	2			2
Commerce/small business	1	1	7	9
Tourism				

This tables points out an increasing interest for animal breeding projects. This may be due to the increasing pressure to reimburse project: this type of project typically helps to buy females (goat or cattle) and the loan can be repaid by selling the annual offspring. Project cannot overcome a limit 75 000 MT corresponding approximately to 5 cattle heads or 20 goats. Agricultural projects are mostly related to irrigation and the amount requested generally covers the moto-pump, the tubes, some fuel, seeds and sometimes fertilizer with a maximum limit of 200 000 MT. Yet the number of agricultural (irrigation) project is decreasing.

Consultative Councils at the different levels play a real role in the selection of projects. Project assessment does not take into account the content of the project but only the character of

tenderer. This includes member of the Consultative Council that do not comply with the rules of the fund: The a district council member's project who had not reimbursed a previous project was discarded.

As in all Mozambique, the main issue of the OIIL in Mabalane is the limited reimbursement rate. In 2013, the cumulative payment between 2007 / 2010 corresponding to the first round of project of 18.894.140,00 MT amounted to only 968 407 MT corresponding to 5,1 % of the sum due (including interests). The Consultative Councils have initiated an information campaign to incentivize beneficiaries to reimburse their loan. Commissions were created and were supposed to visit each beneficiary to request repayment. They also are in charge of monitoring the development of the projects and make sure that the money is being used for the intended activities. A couple of beneficiaries who used money for other objectives (for example to buy cars or upgrade housing) were summoned by the commission to explain themselves: One is said to have already sold the car and reverted to the initial project.

The total amount received by the district is globally divided in three third to avoid any post to be favored. Yet the number of projects submitted is often far below the total amount available by post. This is notably the case of the Ntlavene post with a majority of villages lying in the PNL buffer zone which reported not being able to allocate its full budget. Globally there seems to be little competition between projects except at villas level. Villagers seemed to be reasonably aware of the fund and its potentiality but few of them actually did submit a project and in 2012 all the community member led projects came more or less from the same villages. Villagers explained their reluctance to apply by different reasons: they did not have the necessary documentation which was too expansive to obtain (their identification card costs 180 MT)[9], they were afraid not to be able to pay back, they were afraid of what might happen to the family if the beneficiary died without having repaid the loan. The request itself could be an impediment although the model is quite simple and a simple letter mentioning the name, the identification number, the nature of the project and the value is sufficient. For most villagers, the request was actually written by the school teacher.

In the context of high poverty that prevails, the main problem is that the type of project and funding are unlikely to respond to the need of the poor for different reasons. They are indeed no mechanism to deal with the important risks (drought, death of the main workforce of the family etc) that can derailed even the most trustworthy and hardworking beneficiary: the household with limited assets would be in a very difficult situation to compensate for any unexpected loss. Besides local village context is characterized by important climatic risks, very limited monetization and very narrow market opportunities, market movement being even restricted at district level. In this context most activities can only marginally provide a surplus to increase income and food availability and in the same time pay back the loan. Most poor people actually face food shortage up to 3 to 5 months a year in normal year and their objective as underlined by one school teacher involved in project request aimed only to compensate for the food shortage (by asking for seeds or even directly food). Although leaders claimed not to consider the poverty level of the recipient to assess a project but only his trustworthiness and seriousness this type of project can only be negatively assessed. There are very few activities that would allow providing both for the lack of food and the surplus necessary to pay back the project. Few activities can provide significant employment basis. For example, a 4/5 irrigation scheme uses mostly family workforce and there is indication that only irrigated scheme of more than 8/10 ha provides permanent jobs. Small business opportunity in the poorest village is limited by the extremely limited amount of cash available at village level and even in the largest village or villa area, market movement is restricted. Herding is not a directly paid activities but the herdsman

[9] **The limited monitarization. In village is clearly a limit for many families**

generally a teenager keeps one or two young each year in prevision of his marriage (dowry payment to his wife family has traditionally to be made with cattle). To be successful many poor people would need (long term) technical support for the implementation of their project: Even activities more adapted to poverty alleviation such as project geared toward small animals breeding such as small ruminant or poultry should be associated with adequate veterinary support. Yet technical services prioritize support to emerging farmers. Associations are encouraged to propose project but they do not receive enough support to overcome the challenges of association functioning. In Village 3, an association received a moto-pump from OIIL 18 months ago but they had been unable to connect it for lack of skills and technical support. There is clearly a need to better articulate the different instruments for development mobilized at district level (in this case district services interventions and OIIL projects).

Implicitly this type of mechanism assumes poverty to be exclusively driven by lack of access to (financial) resources and material assets. But except for the most destitute, poverty do not only derive from shortage of assets (inclusively financial ones) but the ability to make the most of existing opportunities due to the lack of social and political capital constraints. It is then no surprise that the OIIL funds have very limited direct or indirect impact for the poor at village level at the moment. Indeed as underlined by CIP monitoring in Mabalane and others districts, district elites such as business people and public servants are the one that most benefit from of OIIL. Fund that cannot be allocated at local level such as in Ntlavene are reverted to the district level: This result in a larger share to Mabalane-Sede residents which concentrates the larger number of civil servants and elites

The role of FDD projects in poverty alleviation at village level is thus debatable. Only the *Better-off* of the community and district elites are able to make the most of this scheme which is little adapted for the poor at village level and have little direct or indirect impact for poverty alleviation at village level.

Different conceptualization of equity

Two exercises were undertaken to assess perspectives on equity. In the first one, interviewees were asked to select a card between four options proposing different approaches to distribute an emergency scheme based on subsidized vouchers. The exercise is summarized in the following box.

In a relief operation an NGO propose to allocate a sum of 60000 MT in a village of 300 households in the form of subsidized vouchers. Different options are possible.

A = All 300 households receive a voucher of a 200 MT value; The leader is in charge of distribution.

B = only one third (100) households receive a voucher of a 600 MT value. The leader is in charge of establishing the list of the 100 households. He promises to do a rotative selection : if another opportunity arise, others households will benefit.

C = only the 50 most vulnerable household will receive a voucher of a 1200 MT technicians of the NGO will establish the list by visiting the community.

D = every household of the community will receive a voucher except the 50 better-offs of the community. The value of the voucher is 240 MT. the list is established by the leader and verified by technician of the NGO

Corresponding cards are presented in Annex 11

BOX 4: EQUITY EXERCICE

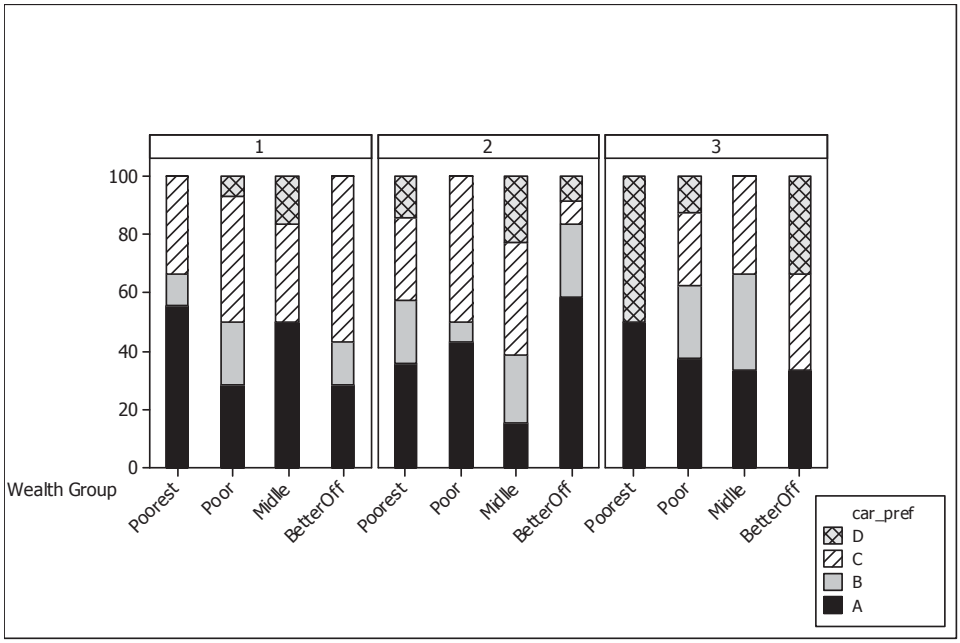
Globally, households favored uniform / "blanket" approach (intervention that reaches all village household) or a pro-poor targeted approach: 39 % of interviewees selected the "blanket" approach (card A) and 36% the pro-poor approach (card C). There was little difference between villages. This result is consistent with report from focus group and interviews which insist on the destructive role of envy and jealousy in community functioning which encourage exclusion or traditional justice mechanisms (witchcraft accusation etc)

The *Poorest* and *Better-off* groups had a preference for the "blanket" approach (card A received respectively 44 % and 45 % of choice) and secondly for the most-vulnerable target option (C card receiving respectively 28 % and 27 %). Indeed as underlined by the flood relief aid outcomes, there is more chance for **all** *Poorest* households to be included in a relief scheme if this scheme target the whole community. A targeted intervention for the most vulnerable does not guarantee access but this depends of village leadership.

Middle range groups have reverse ranking of preference with preference to C option (pro-poor targeted options) with respectively 44 % and 36% of their choice followed by the A options (uniform/blanket approach) with 38 % and 27 % of the choice. Thus in average middle wealth groups (*Poor and Middle*) support the need to target poorest groups in priority.

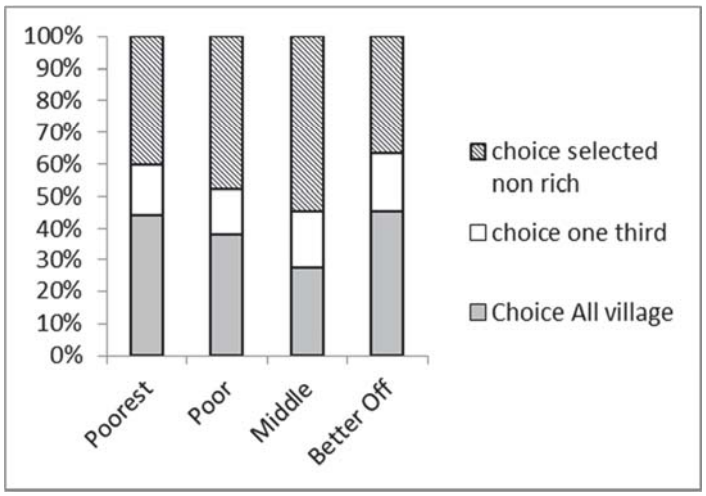
Except for the D option, the options proposed had been used for the allocation of post-flood relief mechanisms. More specifically, the Village 1 leader proceeded to the allocation of vouchers following the B options, and Village 3 declared having followed the C option. In Village 1 discussion revealed tensions following the leader choice and this choice is largely rejected in this village (see figure 9). Interestingly the *Better-off* in this village also prefers a more targeted approach toward the poorest.

FIGURE 13: EQUITY CHOICE BY VILLAGE AND WEALTH GROUP.



This data indicates that at village levels, *Better-off or Middle* groups would be willing to support well targeted interventions even if this means they would not benefit directly from the scheme.

FIGURE 14: EQUITY CHOICE BY WEALTH GROUP, AGGREGATION OF C AND D OPTIONS



Equity perspective of technicians differed from rural households, as assessed through unstructured, aid distribution assessment and developing the same with 6 technicians. They favors targeting households that are the most able to take advantage of the support provided. These are those who already have the adequate resources (labour, equipment, land etc) that is the better-offs. Indeed the distribution of emergency seeds favored for example emergent farmers (and technicians) who received a proportionally larger part of the seed. This choice is however consistent with an agricultural policy which aims at increasing agricultural

productivity by favoring "emerging farmers" and focus on cash crop production at the expense of smallholder farmers involved in food production (Mosca 2011).

Indeed, as underlined by the results of access to post-flood mechanisms at village level, the "all households" approach and pro-poor targeted approach increase the likeliness of the *Poorest* to benefit from interventions. It also highlight that in spite (or because!) the fact that *Better-off* or well-connected households are often in a position to take advantage of external intervention, they also support pro-poor targeted interventions. In any case this data shows that they are a margin for implementing equity mechanisms specifically dedicated to poorest households, but villagers are weary that these mechanisms could be appropriated by better connected households. They should thus be associated with strict mechanism of control.

Our study brought to light the existence of solidarity mechanisms at community level. For example the most deprived people generally benefit from a special water tariffs (20 MT a year for example in Village 1 instead of the 10 MT monthly), or are only requested to clean the borehole. Yet, nor this pro-poor tariffs nor the criteria to access them appeared to be well shared and known at community level (Figure 14) and announced pro-poor tariff varies (table 20). Moreover although PRONASAR technicians and program encourage on paper the elaboration of such tariffs, focus groups revealed that in practice such discussions were never held.

FIGURE 15: KNOWLEDGE CONCERNING SPECIFIC WATER TARIFFS FOR MOST VULNERABLES HOUSEHOLDS

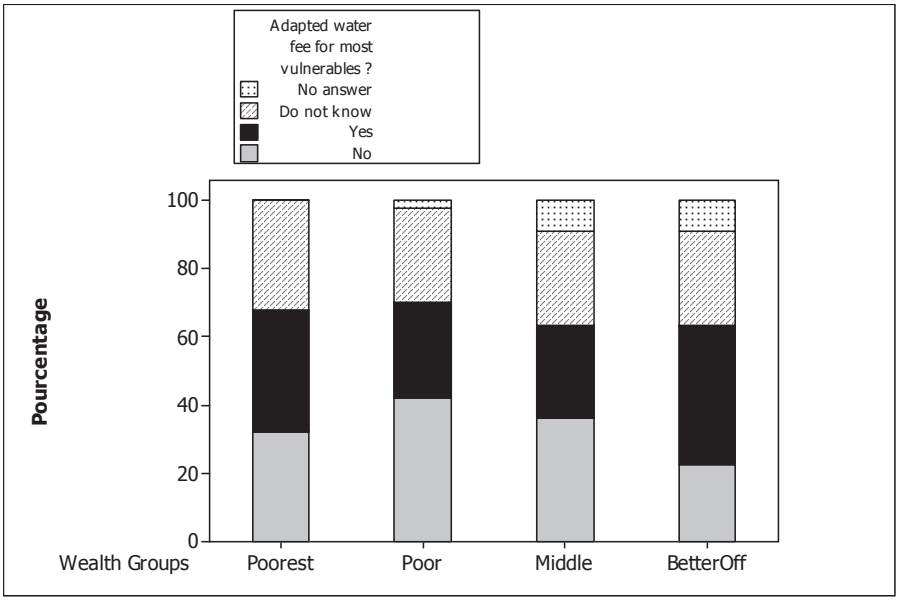


TABLE 22: SPECIFIC TARIFFS FOR VULNERABLE HOUSEHOLDS

Village1	Village 2	Village 3
20 MT yearly : 11	**Do not pay, just clean the borehole:8**	**2 MT monthly:2**
100 MT yearly: 3	**Do not pay: 8**	**No answer:0**
No answer: 0	**No answer: 6**	

Another example is the sharing of irrigation scheme during drought year. We found that *Better-off* farmers occasionally invited poorer households to join and irrigate during a drought. But only a very small number of household were included and specific conditions concerning sharing cost and workforce can be attached (Manjate and Magaia 2010). The most adequate site for irrigation are those close to the remaining water pools (the deepest part of the riverbed) which are also the best cropping sites: they have consequently been long appropriated. They are generally owned by the Better-off and/or leading families of the community. Operationalizing an irrigation association often means that one family has to make available his plot to the association. This generally entails conditions such as the inclusion of the plot owner in the association with occasionally specific benefit such as (land or water) rights. This is however not systematic and some association received land without conditions from plot owner as a contribution to the development of the village or because of Better-off people or communities leaders 'sense of responsibility included in their status.

Interviews and literature underlined how fragile these equity arrangements were: their impact are limited for different reasons (i) only a limited number of family are being coopted in these types of arrangements (ii) When drought consolidates, many diversification strategies become unviable due to water or market competition and the village economy more or less close down as the drought intensifies (Eriksen and Silva 2009) (iii) tenure arrangement may be cancelled when Better-off families want to take advantage of new alternatives or options. This is notably the case of the opportunities offered by FDD funds which permit easier access to irrigation equipment. Our field work underlined that older irrigation associations often had to find new areas as plot owners engaged in irrigation with FDD support, provided they could also mobilize leader's support in the change (for example when a new leader was elected).

In the second exercise, interviewees were asked to select their three favorite development options and three least favorite ones in a package of 18 options as presented in the following box and in annex.

Interviewees were asked to select and justify their choice concerning their three preferred development options and three least preferred options in a set of options presented on cards. The different options have been tried by different program/project in the area although possibly on different value of families targeted. They were the following:

A	A new borehole even with saline water , monthly payment following on-going tariff	K	Subsidy in the form of 20 goats for 20 families on a rotating scheme: off-springs are given to other families
B	A new borehole only if water is not saline, monthly payment following on-going basis	L	Subsidy in the form of 7 cows for 7 families on a rotating scheme
C	A small water system with good (non-saline) water payment on container basis (50 ctv/container)	M	Subsidy in the form of one pair of oxen and plough to one family
D	Rehabilitation or building of a reservoir	N	Food for work program allowing to engage 30 families
E	Demonstration of cistern in 5 families	O	Monthly subsidy 5 vulnerable families on a 50 MT value (which seems to have been translated by the investigators as subsidies to old people)
F	Upgrading of the school	P	Subsidy to 100 families in the form of vouchers to buy input in agricultural fair
G	Motorized maize mill / grinder	Q	Demonstration of innovation agricultural techniques developed in the plot of 1 farmers (but attended by village)
H	Subsidy for irrigation (one moto-pump and 1 year inputs) to an association (40 families cultivating 5 ha)	R	Demonstration of improved pit latrine in 2 families
I	Subsidy for irrigation (one moto-pump and 1 year inputs) to one farmer for 15 ha who commits to engage 5 persons in the village	S	Authorization of making charcoal making on a quota system (Village 3 only)
J	Subsidy for irrigation (one moto-pump and 1 year inputs) for farmer for 20 ha who commits to take 9 other farmers in partnership with him on his own terms	T	Authorization of making charcoal with no conditions attached (Village 3 only)

BOX 5: DEVELOPPEMENT OPTION EXERCICE

The result indicates a preference for school upgrading (chosen by one fourth of interviewees), maize grinder, domestic water access and breeding (cattle and goat) (table 22). Interviewees tended to reject demonstration of latrines on the basis that villagers already knew how to build them or options which benefited a very small number of villagers (Table 23). There was not real difference between wealth groups but choices depended on village.

TABLE 23: OPTIONS SELECTION ABOVE 10 % IN EACH VILLAGE

	Village 1	Village 2	Village 3
Preferred options	F (24 %), G (17 %), M (10 %), P (15 %)	A (14 %), F (26 %); G (14 %), K (16 %)	F (15 %), G (17 %), K (21 %), T (21 %)
Least preferred options	D (11 %), I (12 %), Q (11 %), R (14 %)	B (13 %), D (15 %), M (14 %)	A (13 %), I (25 %), O (17 %), R (31 %)
Explanation	Primary school building but needing small maintenance but the village is ex-centred from the Vila of Mabalane where is the secondary school	Primary school building needing maintenance but away from the vila of Mabalane where is the secondary school The village is closed to the main permanent lake of the area and the junction with the permanent Elephant River.	Very precarious primary school (traditional material), but education is less valued than more developed and bigger village As a buffer zone village charcoal making is prohibited.

TABLE 24: PREFERED DEVELOPMENT OPTIONS

	Option	preference	Reasons given
F	School	24 %	Avoids children displacement to study in other area Would decrease poverty, as children could be trained and have jobs. Will help children instead of having them go away from home (to study) Our school is in precarious conditions, it would help our village (Village 3) Avoid children going in other area, as it is logistically difficult..
G	Maize Grinder	15 %	Will help women to grind maize as they suffer with manual grinding. Those who live alone, like elders or pregnant women can be helped Will help women to save time and effort Pregnant or sick women, elders will be helped as they suffer with grinding.
K	Goats	12 %	Those who never had animals because of lack of money could start breeding Will help a lot of people who has no animals to get a small number of animals We still need goat, they are still lacking It will rapidly cover the whole area, because they are numerous and reproduce easily In addition to meat will provide money to people with animal selling Everyone would have a chance to have goat, there is a lot who do not have any Will decrease poverty of those who can't afford to buy animals Can help not only for the meat but also for selling as it easy to find a buyer . Will help goat production in the village
A	Borehole (even saline)	8 %	Ensure the existence of a supplementary borehole, as it does not impose condition Will ensure a new borehole in the village, even if saline, it is better than nothing. Water is still a problem, a borehole even with saline water is always welcome/ Will increase the borehole number in the area, even saline, it is better than nothing. What is important is to have water, we are not interested whether it is saline water or not. It is not discriminating (selective), ensure the existence of a another borehole whatever water quality Ensure the existence of an additional borehole, water is more important.
L	Cattle	8 %	Will help during tillage and in crisis time you can eat or sell the meat Few people manage to have oxen, this would be an advantage It will helps in the field, to sell or use for 'lobolos' (dowry) It will help in field work as it will avoid people barrowing There is a lot of people without cattle, it will be a help It will help in tillage and could cover easily all the area
P	Vouchers	7 %	The person will buy what please him and will increase production Will increase yield thanks to inputs Will be a very great help as people would have input to increase production Will boost agricultural production Will help in agricultural production as during the dry period, there is big embarrassment Lack of money limits ability of people to buy agricultural inputs Will help in animal production through inputs bought in the fair

TABLE 25: LEAST PREFERED DEVELOPMENT OPTIONS

Option		preference	Reasons given
R	Demonstration of latrines	14 %	People have notion how to do latrine, who do not make them don't want latrine We already have an association [to deal with that] which raises awareness on the need to do latrine A project about latrine building has already been there, people know to how to do pit latrine. It is good, but I have to choose a card ! People knows how to do pit latrine
D	Rehabilitation of reservoir	13 %	It excludes some people, we have all the same rights as we are from the same zone We already have reservoirs, and during the dry period they also dry up, it is better to go the river. It depends on the rains, when it doesn't' t rain it does not help in anything. People will use it for other objectives such as bathing or cleaning clothes instead of cattle drinking. There are already reservoirs and lagoons where cattle can drink There are already cattle drinking point and if in any case they can always go to the river Animals can drink in the river, reservoir is not a priority. Also good but I had to choose a car
I	Irrigation system for 1 farmers (5 jobs)	10 %	Very small number of beneficiaries It can create conflicts due to envy because a small number of people are involved The area has elephants, if they come and it the production, the pump' owner would have still to find money to pay the worker There are already an irrigation system in the village which is not functioning I do not see the point (Village 3) In the village there already are an association with a motopump, but it does nothing, I do not see the point of moto-pumps It benefits few people. It encompasses few people and can generate conflicts
M	Oxen and plough	11 %	Not enough to cover everyone and it is probable that it will generates conflicts Only with difficulties will people have access to the pair, as the animals are few in relation with the total number of people. It is can generates conflicts because it is not enough for every one It helps few people. The death of one animal can make the process more complex. It will not be satisfies everyone, can brings conflicts
B	Borehole only if good water is found	9 %	The equipment of the boreholes depends on good water, if you do not find it, there is no boreholes It selective, we still need more boreholes, even if they are saline It imposes conditions for the opening of the borehole, what is important is to have boreholes, it does not matter if they are saline. Because it selective, it reduce the possibility of having one more boreholes It is really selective, what is important is having water, who wants good water, can go to the river. .
O	Subsidies to vulnerable people	8 %	It benefits to a limited number of people. It encompasses a limited number of old people and the value received is very low. Who don't' have old people [in my home), is excluded from the benefit For those who do not have old people at home, there will be not benefit It is also good, but I had to choose a card The value is very low and it encompasses a limited number of people.

In spite of the recent increase of boreholes,water access appeared to remain a crucial preoccupation except for Village 3 with his 35 households by functioning boreholes. But in Villages 1 and 2, residents still considered water access as insufficient. Yet, the households per borehole rate (above 120) remains well below the national norm which indicates that in spite of the recent review of this norm it remains far above what is considered acceptable by users. Quality of water in new borehole was a debated issue as some villagers considered saline water of little use (not allowing for cleaning clothes, making tea or cooking beans) while others would rather have a supplementary borehole with saline water than no borehole. The different perspective might be due to the relative distance of homestead to existing boreholes and river and/or respective salinity level of their closest borehole. For all these riverine villages, reservoir building was not a priority although some interviewee from the *Better-off* group – the group that owns larger herd of cattle - manifested interest but were reluctant to share it with other uses. In these villages reservoirs are clearly understood as a scheme for animal drinking.

Small water systems (SWS motorized borehole) were also a debated infrastructure. Although some residents were interested as a way to limit labor mobilization, the price was assessed by others as excluding. The SWS was rejected in Village 2 which is close to Chinhequete, where a SWS has been implanted for more than a decade. This SWS has been facing difficulties for years due to poor management.

Interviewees (for two third women) were sensitive to work charge of women and supported option that alleviated it such as maize grinder. Justification underlined that workforce availability is an important criteria at individual level and household with pregnant or sick women, families headed by older person or single person households are considered as disadvantaged and worthy of specific aid. Yet this kind of options was particularly appealing to the *Better-off* group (26 % choice for the Maize grinder) and *Poorest* families had others priorities.

Although little specific interventions concerning goats breeding had been develop in the past, this activity is valued as a food security strategy (able to provide meet or money in case of need). Cattle breeding are also important not only for cultural reason but as a support to agricultural production. Both types of activity received more interest than trained oxen and plough (which in our exercice could provide to only two families).

Globally villagers tend to reject options that directly profited or were being controlled by very limited number of people as they generates envy and internal conflicts in the village; This is for example the case of cistern demonstration: the pilot is necessarily built on private plot and its access is controlled. The main negative comments were expressed in Village2 which benefited from a similar intervention some years ago. As a whole, options assessment took into account risks that could impact village cohesiveness (the death of one pair of oxen, or the risk of not able to pay employees in case of bad production).

The exercise also underlined the limited interest given to irrigation which never was a priority. In particular, interviewee discarded the governance model “association “due to issues of coordination and the risk of unequal repartition of agricultural outcomes.

In conclusion, water remained a key priority of most interviewees although there is no consensus on the best type of SWI (borehole/small water system) and whether to accept saline borehole quality. Following the preference for the “blanket” equity option, villagers favor development options that benefit the whole village or intervention toward development of public good/services. They tended to reject interventions that benefit a small number of people or can be controlled by a few families. They gave importance to options that can enhance village cohesiveness and/or avoid envy and tensions. Globally breeding (goat or cattle) was more valued for food security mechanisms than irrigation. Options that minimized labor mobilization or need are also valued.

At village level local equity mechanisms was found but there are of limited importance, not well shared and impact a very limited number of people. Yet equity perception underlines that there is space to promote targeted intervention for the poorest of the communities, provided village is involved in the definition of selection criteria and an posteriori control of recipients is undertaken to guaranty transparency.

WATER QUALITY A KEY ISSUE FOR USE AND LONG TERM ACCESS

In the northern Gaza province, water salinity limits water access. If the national norm had been strictly respected only 15 boreholes out of the 30 boreholes would have been built during the PRONASAR intervention (Table 24). The salinity average of the boreholes built was 2 650 µS/cm with 50 % of boreholes having a salinity level above the 2 500 µS/cm.

Indeed Mabalane appears to be one of the most problematic district at national level in term of water access as assessed by the district water technicians in a National assessment survey (Annex 2) (MOPH/DNA 2013). Their assessment of four indicators (the depth of boreholes, the chance to find water, the number of saline water points and the chance of successful drilling) ranks Mabalane as one of the most limited in term of access to water. This is particularly the case of two administrative posts (Mabalane-Sede and Ntlavene) while they is better chance to reach water and find non saline water in the Administrative Post of Combumune.

TABLE 26: SALINITY AVERAGE OF THE PRONASAR BOREHOLES IN MABALANE

	Average EC (µS/cm)	Nb of wp below 2500 µS/cm	Average Depth m
Vila*	1 480	5	94
Close river villages	2 600	2	66
Others river villages	3 300	1	66
Combomune A.P	1 600	1	62
Ntlavene A.P	4 150		71
Plateau village	2 380	7	88
Mabalane P.A	2 600		86
Combumune	2 380	7	89
Buffer zone village	3 400	0	41
Combomune A.P	3 520		34
Ntlavene A.P	3 600		46
TOTAL	2 650	15	69

Besides borehole salinity is evolving: two villages indicated that salinity in their PRONASAR boreholes which initially was producing “good quality” (non or little saline) water had reached the same salinity level than older village boreholes. Unfortunately there is no systematic monitoring of water quality at district level so the importance of the issue is not fully understood. .

QUALITY AND WATER USES

Interviews underlined that salinity level determined both uses and maintenance of boreholes.

In the sample studied, each person used in average 18,9 liter of water per day with no statistical difference between wealth groups This value corresponds to a “substandard service”, slightly below the normative basic service level (above 20l/day per person) (Table 5).

Different sources of water were available in the villages studied: principally boreholes (of different salinity level) and river (Table 26). Some households also collected rainwater during rainy season: 3 % of people mentioned collecting rainwater for domestic use during rainy season in our sample. This was only mentioned in village 1 but rainwater collect system was also observed in village 2 so the average level of people drinking rainwater was probably closer to 10 % in reality. Two types of rainwater collecting systems were observed: NGO built tank of large capacity and home-made system based plastic 50 l or 100 l containers. This later systems are more common but have very limited capacity and provide rainwater for domestic purpose only during the rainy season or a couple of months afterward.

Source of water used for domestic purposed varied depending mostly of (i) distance to the source (ii) salinity of the closest water points. In Village 1 the five households that used river for domestic purpose were located closer to the river than to the village boreholes. In village 2, some households choose to collect a small amount of water (a 5 l tank) in the river for specific use (tea and cooking certain dishes) because they were sensitive to salt level. In village 3, eighteen percent of households also preferred using river water for drinking during the hottest months of the year due to the salinity level. Yet boreholes water is globally appreciated for its sanitary quality: They provide "*clean water without small animals*". The information concerning water quality and hygiene one components of the PRONASAR program have been disseminated.

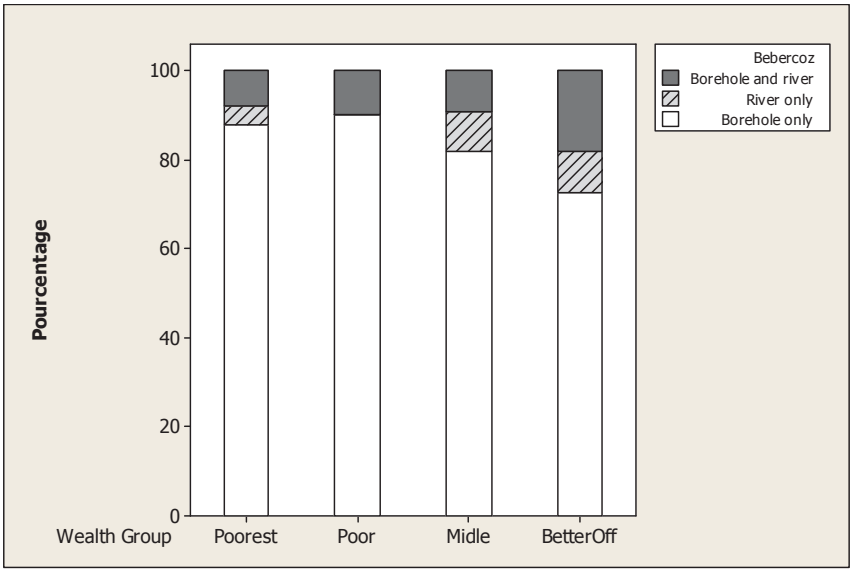
TABLE 27: MAIN WATER SOURCES IN THE THREE VILLAGE STUDIED FOR DOMESTIC AND ANIMAL USE

	Village 1	Village 2	Village 3
Number boreholes	3 (2 PRONASAR built)	3 (1 PRONASAR built) + 1 non funcional	2 (1 PRONASAR built)
Salinity (µS/cm)	4700 (old wp -CPWF measure) 4800 (PRONASAR wp) (3500 old wp CPWF measure)	4900 (old wp CPWF measure) 2800 (PRONASAR wp and measure)	3300 (PRONASAR measure)
Distance to River (walking time)	15/20	3	15/20
Nb Families	180	335	80
% of respondents using only borehole for domestic purposes	86 %	81 %	100 % (except during the hottest month of the year due to salinity)
% of respondent collecting rainwater during rainy season for domestic purpose	8 %	0 %	0 %
% of respondents washing cloth only in the river	100 % (86 % in rainy season due to water turbidity)	96 %	100 %
% of respondents using only boreholes water for small animals	77 %	77 %	73 %
% of respondent using only river for cattle drinking	100 %	100%	100 %

(source CPWF Mabalane interviews and CPWF L2 survey)

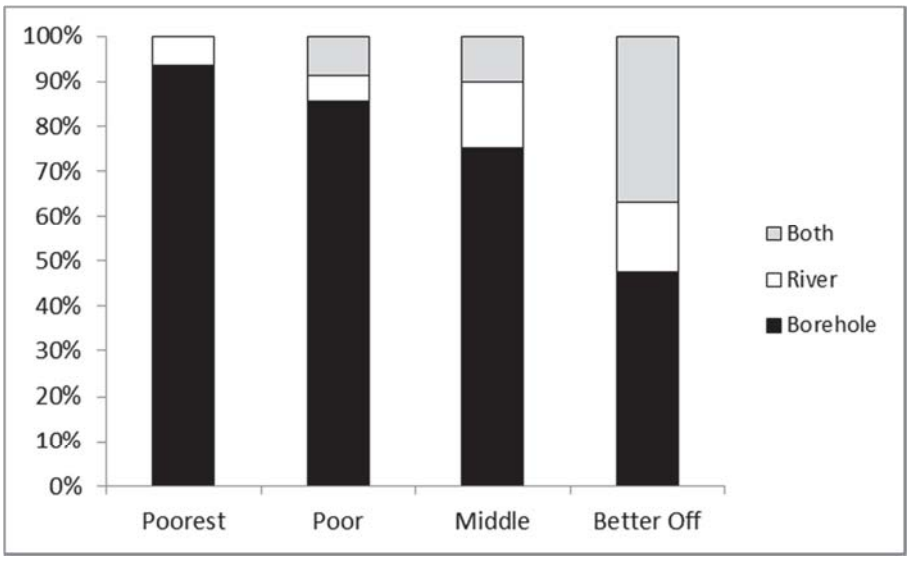
Richer households tended to rely more on river water for domestic purpose (Figure 16) and small ruminants drinking (Figure 17) than *Poorest* households. This can be explain by their better availability of transportation means (drought animal) for domestic supply and may be of workforce for animals drinking ; Yet in all groups some families prefers do use non saline river water.

FIGURE 16: WATER SOURCES FOR DOMESTIC PURPOSES DEPENDING OF WEALTH GROUP



Source CPWF interviews

FIGURE 17: DRINKING SOURCE OF THE SMALL RUMINANTS



Clothes were said to be mostly washed directly in the river: The little saline river water is said to be better for soap and not to leave white traces. But turbidity during the rainy season led 10 % of the population to use boreholes water for cloth washing at this time of the year. Small animals were said to drink both from boreholes or rivers and cattle exclusively from river. Small animals of poorer households tended to drink more from river than boreholes: this could be due either to economic or workforce constraints. In some Plateau villages however, we found that cattle could drink from water boreholes if no reservoir were available and a special water tariffs (by cattle head) was used.

WATER QUALITY AND MAINTENANCE

When various water sources are available, focus group in different villages indicated that population mobilize to fix borehole only if no other water source of lower salinity level is found in the vicinity (Annex 8). In village 1 and 3 for example located a certain distance from the river old boreholes have been adequately maintained even if relatively saline. In village 2, one borehole has not been functioning for quite a longue time and was said to be more saline than others.

THE DRIVER OF SPATIAL DEVELOPMENT: PROJECT IMPLEMENTATION AND HYDROGEOLOGICAL CONSTRAINTS

In Mabalane district, the PRONASAR program built 30 new boreholes and rehabilitated 9 of them between 2011 and 2012. This represents an increase of 52 % of functioning water points in the district, a significant outcome in this water deprived district. Consequently the number of families by water points have substantially decreased passing from an average of 256 families/operational water points to 133 except in Mabalane-Sede where the contractor has been unable to finalize a small water system within the time frame of the intervention (Table 27). The spatial inequality in term of water access measured by the number of water points had also been partially corrected although the villages situated in the buffer zone remained less well deserved that other area. The highest increase concerned the river villages located in the northern part of the district where seven boreholes were rehabilitated and five new boreholes drilled in the large Vila of Combumune-Estação.

This amelioration does not result of a deliberate orientation of the program itself. As confirmed by PRONASAR technicians at national, provincial and district level or the social contractor, the pro-poor clauses of the program **had not been explicitly implemented** in this pilot phase: No part of training programs or information disseminated to technicians for the implementation of the program mentioned or stressed this dimension contrary to the gender issue. While all technicians mentioned the importance of gender issues in water services, none mentioned anything related to poverty. This difference underlined by comparison the lack of importance given to the pro-poor dimensions in this pilot phase.

TABLE 28: WATER POINTS SITUATION IN MABALANE POST PRONASAR INTERVENTIONS (PRONASAR DATAS)

	Nb of operational Wp*	Increase	Rehabitation	New boreholes	% op wp / total	% families/op wp	% op wp / village
Vila*	7	250 %	0	5	9 %	320	3,5
Close river villages	17	42%	2	3	21 %	118	1,4
Others river villages	19	111 %	7	3	23 %	96	2,4
Plateau village	21	91 %	0	10	26 %	83	1,0
Buffer zone village	17	113 %	0	9	21 %	173	0,8
TOTAL	81	52 %	9	30	100 %	133	1,3

*** wp: water points ** op wp: operational water points**
source : calculated using Pronasar data

The initial unequal repartition of water points in the district area is a consequence of the traditional mechanisms of village selection for intervention: easiness of access and/or politician interference.

As in other countries (Booth and Cammack 2013b) the functioning of state services is shaped by external aid and projects. For example, new project cars are most of the time allocated to the service chief and are thus made available for field work if no other priorities arise. While field stipends indeed encourage agents from all levels to effectively undertake field activities including monitoring activities, the bad road state, distance and logistical challenges make an equal covering of the territory difficult. This is particularly the case of the PNL buffer zone which is only reachable by car from the district center approximately 3 months a year. Indeed, the PNL buffer zone is far more difficult to reach and develop. Yet visit reports by state agent show that this real difficulty is sometimes used as an excuse not to try and intervene in the other margin.

The choice for proximity is not only a matter of easiness of access but also of political and social favor. As resident of the main vila, technicians develop stronger social link in the area they live and can be tempted to favor their connection: protest in your backyard garden are louder ! For example, it is clear that the Vilas of Mabalane and Combumune Estação for the Plateau area has been favored by the technical service in the post flood seed distribution scheme (Table 14).

Easiness of access is also a key determinant of the selection of the villages visited by high level (province, national level) politicians (*comicio popular* see annex 5) or donor representatives who has little time to devote to each visited area. Consequently villages near the tarred road (in the southern part of the district for Mabalane) or close to the district center are over exposed to these kinds of visits. Promises are generally being made during these visits which in turn the district government strives to comply to. The interaction between these mechanisms created a vicious circle of investments in some communities in detriment of others. This vicious circle is further deepened by project functioning which stresses the need for outcomes in short term project timeframe (2/3 years), measured in term of concrete indicators (number of boreholes built or water committee created for example). To be sure to achieve these results, technicians indicated they often favored area, villages or population where easy success could be expected, even if they might balance it with one or two more difficult target area.

In the case of the PRONASAR intervention, we did not find coherent stories of how the initial selection of districts was made; but all narratives underlined that the initial selection of districts did not include the most distant districts of the Upper Limpopo Basin and that this selection was re-elaborated. Even then, a couple of more accessible districts were purposely maintained in the

portfolio in order to be sure to show results at the end of the pilot phase (*Provincial DPOH agent interviews*).

At district level it is fair to state the government has been striving in the last years to promote a more balanced development by encouraging for example NGO or external interventions to intervene in the underdeveloped area notably in the PNL buffer zone. Yet this policy faces limit in the case of water access due to the hydrogeological heterogeneity of the territory. While PRONASAR data shows that adjustments had indeed occurred (Table 15), the data hinders the process which permitted to reach this result: It happened that the non-saline groundwater in Combumune administrative post as a whole (both village and river plateau) proved easier to reach that in the Ntlavene and Mabalane administrative posts.

Initially the district government had allocated an equal number of boreholes in each administrative post (10 by post). Technicians insisted that they initially refused any specific demand (for example from the jail and secondary public school). The village were selected by the Post Consultative Councils and boreholes were allocated to villages that suffered the most from water shortage or access either because they had no boreholes, or because the existing water points delivered saline water. Yet it many communities notably in Mabalane AP it proved difficult to find water above 100 m or non-saline water, even if technicians decided not to stick to the 2 500 µS/cm salinity norm. The cutting point chosen was 5000 µS/cm. Table 27 underlines for example that in Plateau village of Mabalane AP, in 6 drilling attempts, only 1 site could be equipped (i.e had water or salinity below the 5000 µS/cm cutting point).

TABLE 29: DETAILLED DRILLING PROCESSES IN MABALANE DISTRICT (PRONASAR DATA)

	Attemps #	Unsuccessful attemps #	Drilling # (water < 100 m)	# Salinity above 5000 µS/cm	#bore holes equipped	Nb late drilling	Failed attempts	Initial attempts
Vila*	6	0	6	1	5	4	1	2
Close river villages	10	1	9	6	3	3	7	7
Others river villages	5	1	4	1	3	1	2	4
Combomune A.P	2		2	1	1		1	2
Ntlavene A.P	3	1	2		2	1	1	2
Plateau village	17	2	15	5	10	6	7	11
Mabalane P.A	6	2	4	2	1	1	4	5
Combumune	11		11	3	9	5	3	6
Buffer zone village	12	2	10	1	9	1	3	11
Combomune A.P	6	1	5		5		1	6
Ntlavene A.P	6	1	5	1	4	1	2	5
TOTAL	50	6	44	14	30	15	20	35

Source: calculated from Pronasar data and CPWF field work

Consequently, the initial allocation of 10 boreholes by administrative post did not stand. Technicians and the district government took then in charge the reallocation of the remaining drilling sites to fulfill the 30 boreholes contract. Village leader interviews underlined that while distant village received only once the visit of the contractor, closer villages received it various times sometimes until some satisfactory site was found. As the contract end was approaching, technicians and district government decided to focus on the Combumune administrative post were it had been proved easier to find adequate drilling sites, notably in the plateau area. The Vila of Combumune-Estação received for example 5 boreholes. The consultative councils were not involved in this second phase of selection and some of their members still criticized the sites or technologies selected: the program had opened space to test different types of pump adapted

to specific situations. So the Mabalane contract specified that five boreholes should be equipped with an Afripump type pump (instead of the AFRIDEV pump model). They proved ill adapted to local situations: in Combumume-Estação four women are necessary to handle the pump because of the high depth. Although the number of boreholes has increased, the population resent this situation. Lack of consultation also resulted in inadequate localization of the pump: one of them is located in a private plot and his absent owner had not been consulted. There is a risk of privatization of the borehole. Tensions related to Pronsar implementation ranks high in the conflict and tensions related to water reported (Annex 9)

It was clear that both the district and the contractor were interested to proceed in the completion of the contract even if it proved not completely adapted to local situation. For the district it was a unique opportunity to build a large number of boreholes in a context of severe water crisis. The contractor was paid on the basis of equipped borehole so its interest in completing the contract was evident.

Other options are possible: in the past the railway village were supply by small water system that pumped directly in the River which is the system retained for Mabalane new water system (which has not yet be completed). Of course these systems are more expansive to manage which residents are not necessarily well aware of. Many specialists also consider that small reservoirs and cisterns are the only viable solutions in the Plateau villages answering both the domestic and cattle watering needs. Unfortunately a project for the development of reservoirs and 20 cisterns was cancelled in 2012 because of the international financial crisis.

SUPPORT TO DECENTRALIZATION PROCESS: STILL A LONG WAY TO GO

Indeed the PRONASAR did not offer the flexibility to adapt to specific situation except concerning drilling sites and in a limited way for type of pump. As underlined in the challenging and heterogeneous hydrogeological context of Mabalane, achieving the millennium goal of providing safe water to 70 % of the population necessitates mobilizing various type of infrastructure. The articulation between PRONASAR and the decentralization process was an interesting step to promote the development of flexibility in water technology and planning. But in practice the mechanisms used while strengthening the role of the provincial administration and technical services contributed to partially disempower the district technical services.

The PRONASAR intervention explicitly aimed to support the ongoing decentralization processes of Mozambican institutions. This was undertaken by putting the provincial level in charge of the management of the program, except for the development of the small urban water system for Mabalane Vila which was managed at central level (DNA). Concretely provincial services were in charge of the financial management of the program, procurement, monitoring and contractual dimensions.

Interviews underlined that provincial level staffs were effectively capacitated and effective learning concerning contract management occurred. This was more a result of trials and error mechanisms than formal training outcomes: A first contract had to be cancelled due to administrative irregularities for example. Then it appeared that first technical contractor had underestimated the challenges of boreholes drilling in Mabalane due to logistical, access and hydrogeological difficulties. His contract was consequently revoked and a new contractor selected (a Chinese consulting firm). Conflicts between administration and infrastructure

contractors are common in Mozambique and frequently reported in the media. Contractors being prosecuted for failing to a contract are not rare. Actually, one contractor is currently being prosecuted at provincial level for failing to respect technical norms in the rehabilitation of a reservoir in Mabalane. Moreover, the contract for the elaboration of the small water system of Mabalane Vila was finally rescinded in 2013 and a new contractor selected in order to finish the work initiated two year before.

While it is clear that they were capacity building and learning of administrative mechanisms at provincial level, these learning processes took time and were not probably planned in the project timeframe. This resulted in local difficulties: for example the social intervention was not really synchronized in the field with the technical dimension of the program which increased the communication difficulties and frustration of communities where adequate site could not be identified (Annex 9).

But the overall functioning of the program remains hierarchical. Interviews underlined that for most state agents the objectives of the program were limited to its bureaucratic or administrative dimensions such as providing working equipment and funds to the administration. Administrative staffs manifested globally a limited change attitude and emphasized mainly the respect of contract terms. District level staffs were mostly involved in monitoring the contractors 'works. They had no contribution in the design and limited one in the development or adaptation of the program. They logically tended to focus more on the respect of indicators (number of committees formed or number of meeting etc) rather than matching the program philosophy. Information or data was being perceived as a demand of Provincial (or National) level, not a basis for their daily work and/or decision making, probably because they do not feel really included in decision making. It is remarkable for example that none of the very numerous indicators collected in communities by the PEC contractor was available at district level and when available they included clerical error [10].

The functioning seemed to have reinforced the dependence links of the district technical services to the Provincial level. District technical services tend to view themselves as the mere executive arm of higher level services with no decision-making significance. Hierarchical functioning and top down pressure is by no mean negative per se as is necessary to discipline state agent to go beyond the capture of aid and program rent to foster impact on the ground. Yet it must leave space to coordination processes and crafting of local arrangement fitting local situation. But in Mabalane the coordination processes and working interactions between the different district technical services could clearly be improved

Other consequence was that innovative ideas to adapt to local situations and challenges were stalled and sometimes not even brought to the attention of provincial or national level. For example, as the local business pointed out its limited capital to store a large number of spares, agents proposed that a FDD project including spare could be developed. But this idea was not taken any further. The argument used was that FDD funds were devoted to agricultural project. The opportunity to better articulate different policies for district development has been clearly missed here.

Moreover the Consultative Councils have been underused during the intervention. They are by law involved in the district planning processes and selection of FDD projects. Participants are

[10] We choose the villages in which to develop the quantitative analysis using the SDPI information concerning number of boreholes and population and village level in order to have comparable situation. Yet it appeared that the number of household was largely over estimated (70 households instead of 300 mentioned). This could be due to an initial error on name village (the neighboring village known to be larger had an indicated population of approximately 70 households). Yet a second borehole was built in this village, a rare treat in the PNL buffer zone.

coopted and party and elite capture was evident. They are thus controlled by administration and party and it was clear that their internal functioning was less participative than intended. Yet just like catchment committees (see part x) these institutions are fully functioning: they meet on a regular basis with two normal meetings a year for district and administrative post councils corresponding to the approbation of the district annual budget, plan and the annual of activities as well as for the selection of FDD project. There are also a certain number of extraordinary councils notably at district levels. Minutes of meetings are all available for district and administrative post at least. These minutes occasionally report dissent to service functioning or complaints. But these minutes also indicates that, just as catchment committee, they are used much more as an information transmission arena than a consultative one except for the allocation of FDD in which councils plays a real indicative role. This is especially the case for consultative councils from post and locality level. At district level, some members of district consultative council questions practices or raise challenging issues but this council tends to focus of Mabalane-Vila and its inhabitant issues rather than overall post development.

In spite of their limits these local consultative councils are the closer form to democratic involvement in district management (Tvedten et al. 2010) but they remain underused. This is notably the case for the PRONASAR program. The program was indeed presented to Consultative Councils (at least at district and post level) as proved in the minutes at its very beginning, but they are afterward very little references to its development or problems met in the minutes except to references to the delays in the development of the small-water system of Mabalane-Vila. A better use of these councils during the elaboration and implementation phase of such a project could probably help to adapt it to district local specificities. It would have in any case helped to bring the perspectives of local inhabitants as well as to bring into light local knowledge (salinity, equity issues etc). As already underlined actors have different conception of equity: at village level they stress the importance of equal access to public services and public intervention and occasionally direct support to the most vulnerable. This means that villagers could accept compromise concerning public good or as essential issues as water access. An arena gathering politicians, technicians and civil society represented by local elites can be the place where these different notions of equities are being confronted so that compromise and acceptable solutions to allocate sparse resources found.

Yet these local councils are still very new instruments and their functioning and role can still be improved. As a political arena, they will remain a place where power is being expressed. But only will they gain force and significance, and learn entirely fulfill their role in if they are given real opportunity to participate to decision making processes that deal with their attribution notably planning for the development of the district.

This includes planning of interventions such as PRONASAR program. An involvement of district actors (both administration staff and leaders, or Consultative Councils) in the design of PRONASAR implementation plan for Mabalane would probably have help to raise different issues that were raised during the implementation such as: the borehole choice versus reservoir, or salinity issues and impact on water access and management. A communication and discussion strategies with consultative councils during the project implementation would also probably have help ed to minimize some of tensions related to the project due to ineffective communication or lack of transparency (annex 9). They could also be mobilized to collectively decide of indicators for targeted interventions or interventions, avoiding subsequent tensions related to lack of transparency in the allocation processes.

Sustainability of SWI: ability of the leadership to mobilize the community

PRONASAR had put a strong emphasis on the restructuration of the maintenance model: as in many countries in Africa boreholes state are indeed wanted. With officially 25 % of non-functioning boreholes (20 % is the National average) maintenance appears an important issue for water access in Mabalane (MOPH/DNA 2013; Munguambe and Langa de Jesus 2011). In a census undertaken by L2 CPWF project in the district in the right margin riverine villages, 12 out of the 36 water points were non-operational (33 %). Official SDPI data pointed out 31 % of non-functioning borehole prior to PRONASAR intervention.

It is now widely admitted that maintenance of water points are directly related to the way community were mobilized during the development phase with focus of early involvement and development of a sense of ownership. It is notably recommended that pump should only be installed after a participatory approach to mobilize the people and create village level maintenance structure. Other important determinant of maintenance success has been found to be the availability of spares, the length of training and content of training which should include both technical aspects and a community mobilization dimension, and to let community choose people to be trained without attempting to create new democratic mode (Batchelor et al. 2000). This study also acknowledges that complex reparation that is rare second level repair might not be solved at village level. The PRONASAR strategy has obviously taken into account these recommendations.

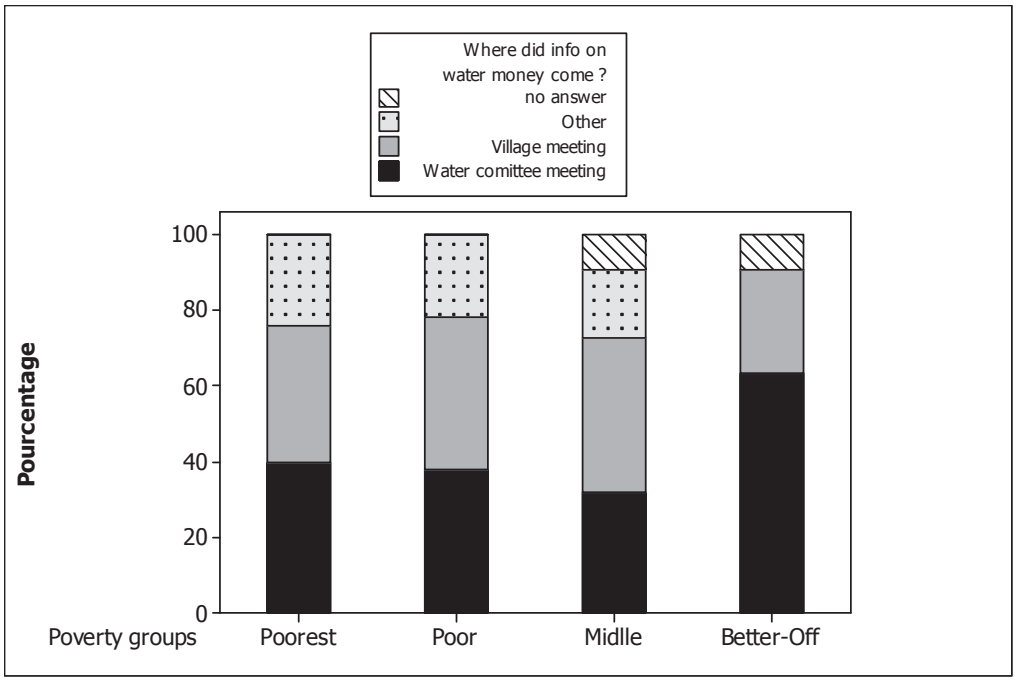
In the area maintenance of boreholes is globally acknowledged as a local or community issue. Most of the boreholes were built in Mabalane in a context of urgency and relief operation (post war/post flood). Various NGOs and structure were involved in the development of these water points namely Auxilio Mundial (World Relief), LWF, CARITAS and PROMUJE and they had their own strategies in term of community mobilization and training so the extent of community initial mobilization or training remains unclear.

Yet in all the villages visited a water committee existed although its power and role varied from one village to the other. One person of the village was generally specifically in charge of the maintenance of the hand pump. This person had generally been trained by previous projects. Some villages were proud to show us the maintenance instructions left by these projects which had been carefully conserved by leaders. Moto-pump mechanics are also intervening in borehole maintenance. So most village have someone able to do the regular maintenance of the boreholes although the quality of this service can be questioned as this person has apparently not necessarily received a proper training. Previous projects had generally trained more than one person but 15 or 20 years afterward few trainees remained in the village. People that are generally entrusted to do the maintenance of the water point are often young, dynamic and capable – that is why they are selected. This means that they are also more likely than others to migrate and look for better opportunities and in many case, committees mentioned that the people that received the training were not there anymore. Indeed, NGOs now encourages training a large pool of people within village including women which are more likely to remain than the young and dynamic young men often chosen for this task (Batchelor, 2000)

Our survey underlined that the role of water committee is unclear to villagers: the committee was in charge of the management of borehole for 38 % of respondents while it was the

community leader for 28 % and another person for 33 % (the mechanics or treasurer for example). But when something is wrong in the borehole 72 % would report the problem to members of the water committee and 25 % to another person of the community (not the leader), 4 % not knowing where to report. 43 % declared learning about the use of water money through committee meetings, 28 % through village meeting and 33 % by other mean. There was little variation between villages but proportionally *Better-Off* people reported being more informed by water committee than other person (Figure 18).

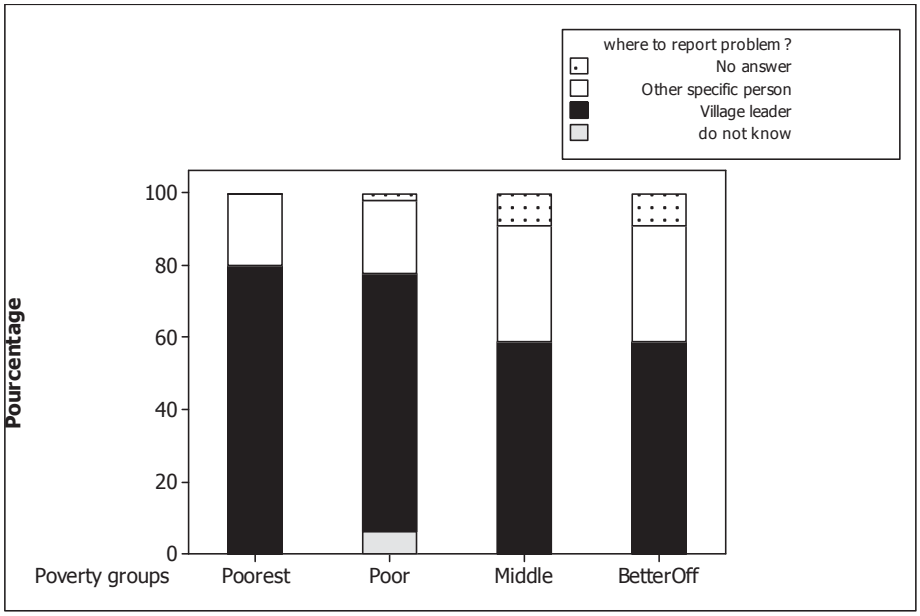
FIGURE 18: WHERE INFORMATION CONCERNING USE OF WATER MONEY WAS GATHERED.



Poor and Poorest households were more likely to contact directly the leader in case of problem than any person from the water committee (Figure 19). This tends to indicate that the wealthier villagers are better informed about the existence and role of water committee than other households.

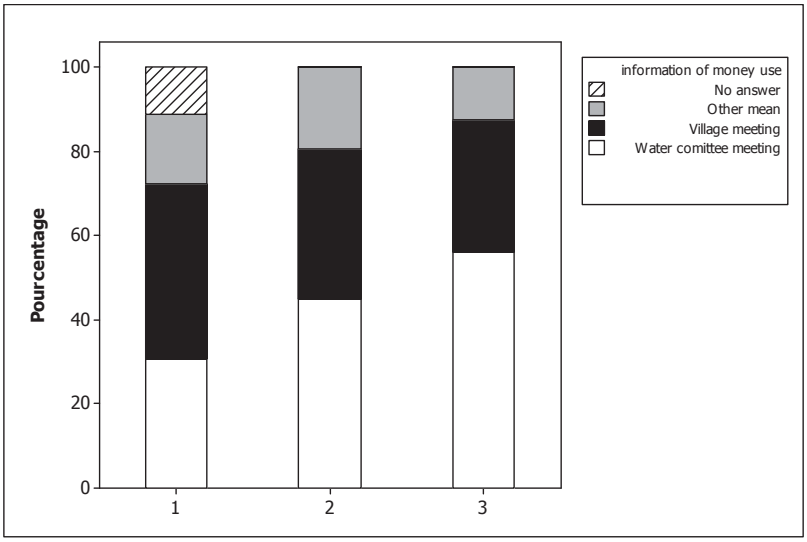
This confusion can also be linked to the way information and mobilization is being organized at village level as revealed by focus group. If the borehole has a small problem, the person in charge of maintenance will go and try to fix it on its own when informed. If the spare or other material not locally available is needed, the restricted water committee (people in charge of maintenance, money keeper, secretary and president) has to be mobilized to provide the necessary funds (from the borehole maintenance funds coming from water fees). The leader is most of the time informed when not involved in the decision. If enough money is not available, the leader is in charge of convening a village meeting where a supplementary contribution will be requested. The role of water committee is perceived differently in the 3 villages but the reason for this difference is unclear (Figure 20). Does it result from better functioning of the committee, from a better articulation of the committee with the community and community governance structure or from a better community cohesion or smaller population facilitating direct interactions ?

FIGURE 19: PERSON CONTACTED IN CASE OF PROBLEM IN BOREHOLE



Committee members are most of the time nominated by leaders and not elected. Focus groups revealed that the social intervention within the PRONASAR intervention gave a specific attention to structuring water committee under the assumptions that fully staffed committees lower the risk of money mismanagement. In village 1, two committees were formed but the third one not yet finalized at the time of this interviews. But in village 3 there were only one committee for 2 boreholes. Discussions indicated that their good functioning resulted more from the commitment of a couple of key person (the mechanics and/or secretary and sometimes the president who keeps the money) than functioning following the normative recommendation of PRONASAR.

FIGURE 20: HOW INFORMATION CONCERNING MONEY USED HAS BEEN OBTAINED



An historical analysis of borehole functioning and maintenance revealed that access to spare or capacity is not the main limiting factor to reparation in the area except for very specific case (e.g no more seller in Mozambique of the type of hand pump so no available spare at all): A village could have one well maintained borehole and a non-operational one and a rapid investigation of maintenance history underlines that reparation are being operated but often on an irregular basis. A borehole may be non-operational for many months and then repaired. Isolated communities may have very well maintained boreholes and short break down duration.

Spares are at the best available in Chókwè city (100 km away) or in Maputo One of the mechanic undertake regular visit in Maputo and is able to bring back spare that cannot be found in Mabalane or Chokwe. Other interviews confirm that motivated communities are able to find reliable person inside or outside the community to find the spares. Distance of course increases spare cost but more importantly it increases the delay for reparation. So distance is not so much a limiting factor for spare access as factor of repair delay; Consequently it is likely that the development of a local supply chain of spares as previsted in the PRONASAR program will not so much reduce the % of non-repaired boreholes (abandoned) but the delay to repair borehole. Money thus seems to be more limiting than spare availably.

Collecting quotas at the time of break down does not delay reparation (Batchelor, 2000). Thus monthly payment is by no way the only way sustainability can be guaranteed. It is now recommended to letting the community choose their financial mechanisms between regular payment or exceptional quotas which was being explicitly acknowledged by PRONASAR. Yet focus group revealed that tariff meeting organized by PRONASAR focused exclusively on the fixation of a monthly fee and did not mentioned other options nor the possibility to institutionalize social tariffs for some members of the committee

Money thus seems to be more limiting than spare availably. The survey does not point out toward major transparency issues with 87 % of people informed of money use and 84 % approving the use.. *Poorest* group tend to be slightly less informed and satisfied (Figure 21 and 22). They were small difference between the *Poor* and *Poorest* group that could be explained by a lower degree of degree of "connectedness" of poorest people, by lesser engagement in community life or stronger exclusion perception.

FIGURE 21: SATISFACTION CONCERNING INFORMATION ABOUT WATER MONEY

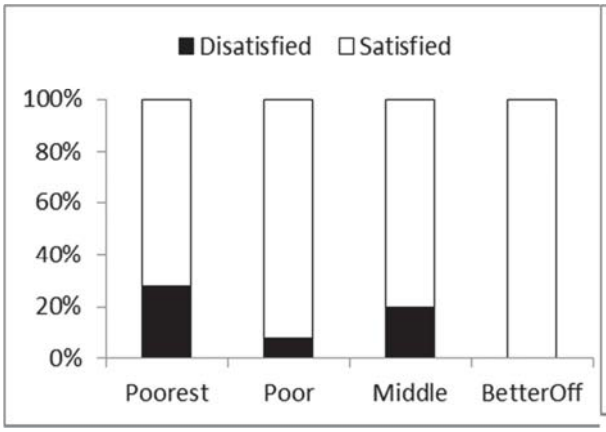
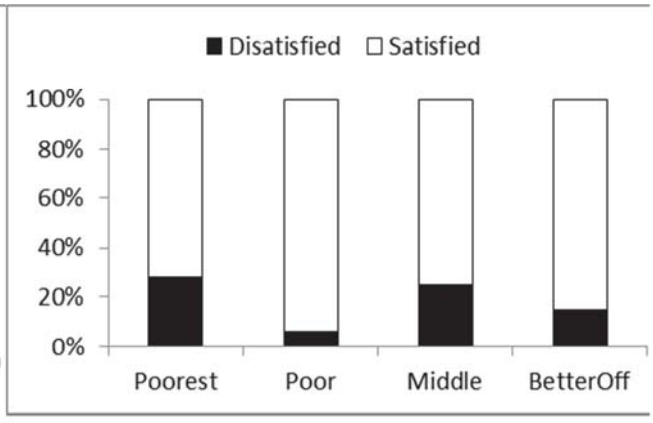


FIGURE 22: SATISFACTION CONCERNING WATER MONEY USE



Fifty seven percent out of 115 people declared to be in time of their water fee payment. This number varies village from village (Table 29) with a majority of resident of Village 1 declaring having more than 6 months debt while 70 % of Village 2 declared having last paid water in the last 2 months. On the contrary a majority declared being in time in village 3 while informal discussion underlined the tariff payment discipline has relaxed during the last two years. For 92 % of interviewers this last payment was the monthly fee and only for 5 % did it deals with water debt payment or exceptional participation for repair.

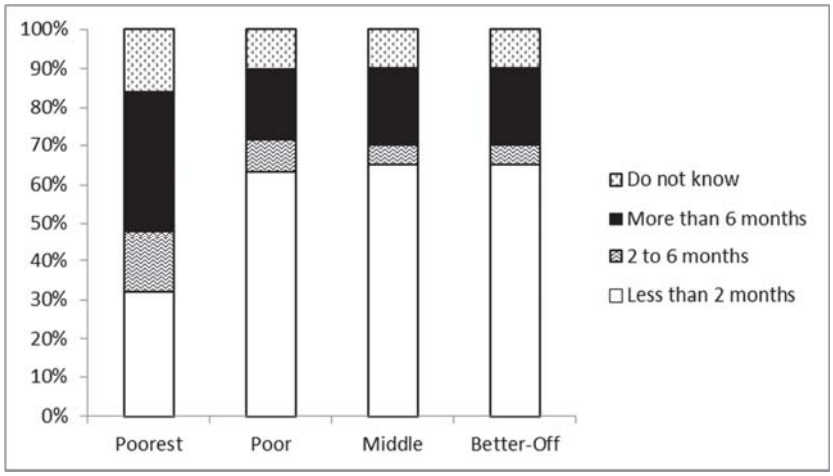
TABLE 30: DATE OF THE LAST PAIEMENT OF WATER FEE BY INTERVIEWEE

	Less than 2 months ago	2 – 6 months ago	More than 6 months	Do not know
Village 1	26 %	6 %	68 %	0 %
Village 2	70 %	7%	4 %	18 %
Village 3	63 %	19 %	13 %	6 %
	57 %	9 %	23 %	11 %

Source CPWF IWEGA study

Interestingly, there were a clear difference between the *Poorest* group and other wealth groups in fees payment date (figure 23) : Either *Poorest* households really struggle to keep paying they water fee in time or were more honest in declaring payment delay!

FIGURE 23: LAST PAYMENT OF THE WATER FEE ACCORDING TO WEALTH GROUP



We were able to check the water fee book for 2012 in Village 1. It had at the time only 1 functioning borehole. A second one was under construction. The book was a former register for animal vaccination which had been used for the last 5 years as the water payment logbook. The global annual balance by household was calculated in separate sheet (in Changana) and only total reported in the logbook. According to the data, 18 205 MT had been collected in 2012 for a total 275 households registered, an average of 66,2 MT/families paid (for 1 borehole) . This represented 55 % of the expected amount if all family had paid the full water fee amount. But only 21 % had paid the full amount and 53 % had more than 9 months debts for 2012. However, this data globally correlates with the data of the survey. The book had no entry for 2013.

TABLE 31: PAIEMENT OF WATER FEE IN 2012 IN VILLAGE 1 ACCORDING TO BOOK

	Nb	%
Households having paid water fees	181	66 %
Households not having paid water fees at all	94	34 %
Households having paid the totality of the water fees	58	21 % (32 % of the paying households)
Households than paid but paid less than 9 months	53	19 %
Households indebted for more than 3 months inclusively those not paying	147	53 %

Source CPWF IWEGA study

The committee was provided by PRONASAR the borehole book (in Portuguese) which can be replaced at the price of 10 MT. There was only one book for the village although 2 PRONASAR boreholes had been built in the village. This book had started to be filled but very incompletely (25 families registered, only 10 entry). Although quite complete, this book seemed little practical for people with limited literacy skills. For example the list of family has to be written again each trimester which can be very burdensome (275 families were registered in the former book).

Assuming that 55 % of a village households is paying in time and that there is no mismanagement of money the amount of money easily available in each boreholes would be around 66 MT per family using the borehole, that is between 19 800 (300 families) to 6 600 MT (100 household) a year. The amount of money declared to be available at the date of the first field visit in different village points out to sums between 3000 and 8000 MT. According to this data, we can estimate than any repair superior to 10 000 MT per borehole necessitate an extra call for money and further delay in repair.

PRONASAR promotes the inclusion within SDPI budget of a budget for borehole rehabilitation or important repair (those out of reach for villagers). There is no clear thresholds for what was considered out of reach for villagers either in term of type of interventions or value; The PRONASAR also aimed to identify local mechanics. Focus group underlined that experienced local mechanics are known to villagers. Rather than limiting the number of "certified" technicians, a technical upgrade of all people acknowledged as technician could decrease delay repair. These technicians should also be involved in the training and follow up of the pool of villagers in charge of local maintenance. In any case the contractual basis that will link the mechanics to the SDPI should be clearly made known to villagers.

So finally the sustainability lies in the ability of the leader to mobilize the community to pay for the repair. Difficulties of mobilization were repeatedly reported in two cases: (i) the community do not think it is worth paying for repairing the water points because the quality of water is not poor and there are alternative source of reasonable quality at walking distance.) (ii) the management and/or implementation model of the water point created important tension within the community and between the community and the sponsor – up to the point of vandalism sometimes. Contested leadership will also weaken mobilizing capacity even water being a rare resource in the district it is also possible that communities are able to overcome their difference to contribute to the reparation when it is necessary.

Small scale irrigation: an uncertain economic sustainability

Small irrigation has been developing in the area during the last years. It is not an innovation per-se as local elites were already using moto-pumps before independence. In the last twenty years, its development was supported by NGO and government mechanisms (INAS projects etc) mostly as a drought relief mechanism. The FDD credit system has boosted for a while the development of individual small irrigation by funding irrigation equipment (moto-pump) and fences. The number of irrigation projects funded by FDD is however decreasing (16 agricultural food production project funded in 2011, 3 in 2012, and 11 in 2013). As labor is the most limiting factors of these communities facing high emigration rate and HIV prevalence, there is no real interest in labor intensive scheme such as manual irrigation. Such systems were only maintained on their own in rainfed villages where agricultural potential is limited or associated with Food for Work mechanisms. Small moto-pump which requires long irrigation are also little appreciated. Yet small garden can be found around the Limpopo River in some villages and in the rain-fed area around some reservoirs.

Our survey identified four main models of governance of small irrigation system in Mabalane. A fifth one, based on partnership between commercial farming and an association of small farmer was reported in the neighboring Massingir district but has not been investigated (Praagman com pers)

Association has a connoted meaning in the Gaza province. It designs a collective scheme where part of the land (a plot) is allocated to the association as a group and the rest divided between members with individual management. The association plot is meant to be cultivated collectively and its outcomes to be used for a collective purpose for example paying for the functioning of the irrigated scheme. There is consequently no water fee but members can be requested to pay a supplementary quota to buy fuel and spares if necessary that if the amount collected through the collective plot is insufficient. The irrigation committee generally includes a president, a secretary in charge of monitoring expenses and incomes of the association and a production chief in charge of the management of the moto-pump. He is generally the only one authorized to deal with the moto-pump.

Partnership is a more traditional governance system, where various farmers aggregate around equipment and land, which remains privately owned. Each member is given the right by the owner of the infrastructure and land to cultivate under certain conditions, generally concerning the participation in irrigation costs and sometimes labor. Partnership do not involved a collective plot and the repartition of land and cost can be unequal between owner and members. Solidarity mechanisms targeting irrigation during drought follows this governance model. Interestingly the latest government interventions subsidizing equipment also refers to this model.

The purpose of irrigation can vary from one actor to the other, either as an income generating activity and/or drought relief mechanism that is a coping mechanism to get staple crop during the hungry gap period if the production was lower than expected. This confusion is coherent with the diversity of irrigation model in the area but technical services are unclear on the subject.

TABLE 32: THE FOUR IDENTIFIED MODEL OF GOUVERNANCE FOR SMALL SCALE IRRIGATION

NAME	**The "irrigation heir"**	**The "new comer "**	**"Association"**	**The partners in irrigation**
Ownership of equipment	Individual	Individual	Collective	Individual
Development pathway	The family has been involved in irrigation for a long time and the owner has developed technical and managerial skills	Uses existing opportunity to start irrigation (FDD, appropriation of unused association moto-pump)	Developed with external support (NGO, PNL) – although local initiative through FDD can be found	To be assessed
Land tenure	Stable: Family access to suitable areas (close to remaining pools)	Has normally family access to suitable area but the area might have been let to other people/association and might need to be renegotiated	Suitable area had to be negotiated with community; unstable tenure right. One area of the scheme is collective (association plot) other area divided in individual area	The owner provides the plot and owns the moto-pump
Workforce	Family + hired permanent external workers (2/5)	Family based: occasional workforce hired	Family only	The owner creates partnership with other families of the community of his choice. They divide the plot, cost and work on a unequal basis
Production	Horticulture market oriented	Horticulture market oriented + subsistence	Subsistence farming + market of surplus	To be assessed
Outcomes	Quite successful especially if owns his own motorized transportation which allows him to access distant market	In a learning curve and still struggling for economic sustainability	Struggling with a diminution of membership around time (from 10/30 member to 4/6 irrigators). Operational functioning is only possible by other resources.	To be assessed

As a food security strategy small irrigation should provide either food and/or wages during the hungry gap season that is the dry hot season starting in September /October until January/February depending on the beginning of the rainy season (and the first crop). Yet this period is also the hottest season with highest level of evapotranspiration and pumping costs are consequently very high, contributing to the exclusion of the poorest of the communities from this kind of irrigation. Small irrigation during the rainy or post-rainy seasons is more accessible but this is also when competition for labor is the highest. The labor short family which are generally the poorest of the community (old people headed households, etc) may find difficulties to face these competitions and favor their low cost rain-fed plots rather the irrigated ones.

As already underlined, although land is not globally restricted, finding a suitable site for irrigation that minimize costs and labor can be challenging: the land. The land closest to the river is also the most fertile area. Permanent access to water in the river is limited to the

remaining pools in the river bed and because these areas are the most fertile and interesting areas they have long been occupied and appropriated by powerful members of the communities.

Mozambique is characterized by the existence of a dual system of customary and statutory land tenure (Annex 13). Most of the time smallholders and communities rely on customary tenure regimes where the traditional chief (3rd scale leader) allocates land to a family. This land can be inherited. In the family sector and community security of tenure is guarantee by occupation, community membership and may be strengthening by planting trees. The statutory land tenure states that according to the Land Policy (1995) and the Land Law (19/97) all land in Mozambique is State property. But users may protect their land right by getter a right to use and exploit the land (DUAT – *Direito de Uso e Aproveitamento da Terra*) which can be attributed to individual or community. Private Private investors usually use the statutory system to get access to land which includes the negotiation of compensation to the community.

At village level there are two main ways of securing land suitable for irrigation:

- Absentee landowner (for example who has migrated to South Africa and not yet come back to the village after war or migration). Although this case was not formally identified, in some village widows may be in a disadvantageous position to maintain their right on their husband land in the traditional tenure system

- Negotiation with the landowner, concerning his integration in the association and his land share depending on his relationship with village leaders and government officials. In some way the collective and common goods have some weigh in the negotiation and if a landowner can in some cases refuse to let his land being used, few cases were identified. In two villages however land conflict had blocked the development of a collective irrigation scheme supported by external intervention.

In one village however the landowner negotiated a larger share of land with the intervention staff supporting the development of the scheme but this was later denied by the association and he withdraw from the association.

Because of this situation, small irrigation is characterized by unstable tenure and cases of moving schemes are not rare. The development of the OIIL funds which allows well connected and informed individuals to acquire irrigation material to develop their own scheme is thus increasing the competition over land suitable for irrigation. Change in village leadership or government district which evolution of the power network between actors offers opportunity for the landowner to claim back his land and develop his own individual irrigation system.

In other case association had to move their land because of a large area of land was allocated to commercial farming by the government. Indeed the land attribution mechanism state than the private investor has to compensate the community and negotiation is necessary between the community and the investor for the DUAT process. Compensation is made in the form of investment in the village (building or equipment of school, hospital). In both villages where this compensation had been negotiated, the communities were still waiting for the commitment to be fulfilled a couple of years after the investor had started his operation. These difficulties concerning the relationships between private investors and community are not rare (Tique 2002). In this context, the work developed by the NGO LUPA to get a DUAT for collective irrigation schemes may be useful to secure the association's land right but also create internal community conflict if initial landowner rights are not fully acknowledged during in the DUAT process.

In practice irrigation timing depends of the availability of fuel: at association level there are more break due to fuel shortage than breakdowns of the moto-pump, although the latter may generate longer delay in irrigation timing. There are two main irrigation periods: post rainy season (April to august) and the dry season (September to December) which is also the hungry gap season; the latter is associated with very high evapotranspiration rate and consequently high irrigation cost; They area all the more expansive than until September 2013 the closest fuel station lied 100 km away (on non-tarred road). Until then, moto-pump users have no option but buy fuel in small quantity at a price 25 to 50 % higher than in Chókwè, to find a transportation option to bring fuel from Chókwè or entrust the money to a transporter.

During the dry season, water in the Limpopo River (non-permanent) can be scarce and suitable irrigation place limited to area close to remaining water pools. Yet because it is also the hungry gap period it is also the time when irrigation is the most appealing for subsistence farmers. Irrigation is less expensive during the April to August period but if rainy season has been good or flood occurred, rainwater and/or rescinding flood cropping systems will be preferred as they are less expansive.

There has been no systematic economic assessment of irrigation model on any on the irrigation model found in the area and there are very little data available on the economic and technical performance of small irrigation scheme in the area or its contribution for food security at village or household level either in individual or collective scheme. The only data available comes from an economic survey initiated by the PNL project which are summarized in the following table..

TABLE 33: SOME ECONOMIC RESULT OF SMALL IRRIGATION SCHEME SUPPORTED BY PNL

	Non irrigated Maize	Irrigated Maize	Irrigated bean
Gross margin (MT/ha)	550	2 350	73 310
Work day payment (MT/Ha/jour)	22,4	18,8	505,0
Cash need (MT/ha)	250	4 770	10 550

Source: CPWF IWEGA - adapted from PNL data, kindly provided by Mr T Meque. No reference to the number of plot monitored or irrigation season

This table underlines that if irrigated crop was indeed much more profitable than non-irrigated ones, the need for cash for irrigation was also extremely high. In the context of extreme poverty faced by many villagers which are short of food up to 6 months of the year, finding cash to support the functioning of the scheme without considering paying the workforce is a challenge; Interviews indicated that in many situations cash is only available by selling charcoal, an option which is impossible in the buffer zone area. The cash need for an hectare of maize corresponds to the price of a couple of small animal (goats) and the price of a small cattle for irrigated bean. Irrigation is thus only an option for the wealthier families that are able to derive cash on a regular basis either through charcoal production or migration remittance. This probably explains why in most associations 2 to 5 years of autonomous functioning only a few families (4/8) are still planting crops in a scheme. Others families have desisted over time mainly because they were unable to contribute to the supplementary fuel quota.

The coordination cost of small collective irrigation systems are high and often underestimated in project elaboration. There are all the more important that there have been only rare previous experiences of collective work, and a tradition of top down functioning. The underestimation of coordination issues results in lower yield than expected. This in turn impacts the economic performance of the scheme with higher cost and insufficient production from the collective part to cover for the next cropping. Only long term support and capacity building can help reduce

these costs: In most of the case the association only receives a support during the first year of their functioning. As lack of transparency between local elites controlling irrigation management committee is generally the rule rather than the exception the opportunities offered by external support of the scheme is often appropriated by a few well connected families controlling the irrigation committees.

For these families the system indeed provides return at least in term of food security. But they are also the better off families of the village able to advance regular cash sums for fuel. Can this small irrigation scheme contribute to village food security through job creation? Private small systems of less than 5 ha have no direct impact in local jobs are they are family run enterprise. Only medium scale well-functioning systems (over 8 – 20 ha) contribute to job creations. As families contribution for fuel increase, both the number of families and the cultivated area decrease so an 15/20 ha collective irrigation scale gathering 15 to 20 families will generally leads to a 4/5 ha scheme gathering 4/8 families with no significant jobs input at a village level. They must also have enough workforce to exploit both the collective and individual plots. The local market for horticultural crop is limited while the closest market is located 100 km away in a non-tarred road. But this is also the main irrigation area of the countries, using irrigation gravity. Any production from Mabalane will compete heavily with local production in this area. It is besides unlikely that staple crop system can cover irrigation costs (including equipment cost) and food security objectives in the same times. It is likely that only high value crop will allow that which are probably associated to higher production costs, good technical skills, good market organization.

The evolution of association also tends to indicate that the coordination costs and issues have been systematically neglected. When external intervention provided technical support, it focuses on technical aspects (building and technical functioning of irrigation) sometimes including managerial dimensions focusing on cost monitoring and water fee collect and management. But coordination mechanisms that organization between members to share water and maintenance which is as the heart of collective irrigation system has rarely if ever being tackled or even considered. It is then no surprise that association have sustainability issue.

REPRESENTATION OF SMALL SCALE WATER USERS IN BASIN GOUVERNANCE INSTITUTION (RAPHAËLLE DUCROT AND ELKE PRAAGMAN MSC STUDENT WAGENINGEN UNIVERSITY)

The Limpopo Basin Committee (Comite de Bacia do Limpopo - CBL) is a coordination body between users, institutions in charge of the management of irrigation and the other institutions in charge of the use of land and water. The CBL depends on the UBGL (*Unidade de Bacia Do Limpopo*) itself a division of ARA-SUL. By status, it is a consultative body for the director of UGBL with the responsibility to provide whenever requested advices and assessments. The CBL is composed of 12 members directly appointed by the committee which are: the director of UGBL, a representative of the provincial government, a representative of MICOA, a representative of the provincial department for rural extensions (rural services), two representative of irrigators associations, two representatives of commercial farming firms, two representative of private farmers, two representatives of the institutions in charge of irrigated schemes. Meetings gather a larger number of people than the formal members of the CBL and the invitation is extended to the most important water users (commercial firms notably), to all administrative services and even city councils. The CBL was created in 1998 but has been regularly functioning only since 2004 with two annual ordinary meetings a year, and extraordinary meeting on request (in case for example emergency situation or accident).

Only a small part of water users or governmental institution is actually represented in the committee as underlined in annex 14. Farmers are especially poorly represented: neither smallholders, traditional water communities nor isolated farmers association are represented. Participation is also limited by distance and cost of accommodation and transport.

UBGL in particular is in charge of delivering water to attend the irrigation water request made by the irrigation scheme (HICEP and RBL) base on a planning of irrigated land for each farmer. However, farmers and association located on the perimeters but who directly pump water in the Limpopo River do not interact with ARA SUL (for license or water fee for example) through the irrigation management but directly with UBGL

ANALYSIS OF THE FUNCTIONING OF THE CBL THROUGH ANALYSIS OF THE MEETING MINUTES 1998-2011.

Twenty minutes of the committee meetings were analyzed (from 1998 until the 21st ordinary meeting -May 2011). During this time, the CBL held 21 ordinary meetings and 5 extraordinary meetings. The minutes contains the list of participants, occasionally the list of persons invited, the main content of the presentation held during the session, some elements of the debate; A couple of document also included a summary of the decisions.

The 3 first meetings (2 in 1998 and 1 in 1999) aimed to design and develop the CBL. This phase was disrupted by the 2000 flood and the meetings only resumed in 2001. These first 4 meetings focused on the design of the CBL (composition, regulation). Underlying tensions between HICEP and UBGL regularly appears in these first meetings with mentions to debt of HICEP concerning the gross water tariff among others. HICEP participated irregularly during these first years. 8 farmers were invited to the first meeting and 5 of them attended. In latter meetings their participation did not overpass 2 persons. Farmers initially asked for a more diversified

representation of farmers: Different type of farmers were actually farming in the Chokwe scheme (namely commercial farmers, big, medium and small farmers) and would been affected by the decisions concerning water differently which supposed a differentiated representation of the farmers group. But at the end the farmers' representation excluded smallholders or even medium irrigators. Beside some confusion appears in the notion of representativity: for example HICEP defended the position that they represented the farmers that irrigated in the scheme. The first meetings also focused on the presentation on the legal framework that underpins water management as well as provided information on the basin. The content of meetings rapidly evolved to the format that will kept in following ordinary meetings: presentation of the climatic and hydrological situation of the basin with prevision and simulation of hydraulic availability for the next 6 months period, assessment of cropping and irrigation in the past period and presentation of the demand for the next period, presentation of the state of advancement of the different projects notably those concerning big water infrastructures. Many of the questions in this first phase focused on the clarification of information.

After 2001, meetings were regularly implemented. During this second phase, ARA SUL and UBGL staffs represent 20 % to 50 % of the participants of the meetings, which gathered between 15 and 33 people (with an average of 23). Local authorities (with representatives of district administration and services, city council, city) represented in average 5 persons in each meeting (between 10 to 30 % of the participants of the meeting) but there was a high diversity of representation from one meeting to the other and this tended to even more diversify over time. More than 17 different authorities (service districts) participated at one meeting or other during this 10 years time. The provincial governor attended twice (during the drought period 2004-2006).

The representation of private and institutional sector was characterized by also changes reflecting the rapid evolution: Many institutions were remodeled with another name, firm were created or transformed, and this transpired in the list of institutions that attended the meeting; This was particularly the case in the case of the Xai Xai irrigated schemes, that was destroyed during the flood and rehabilitated afterward. This evolution translated into the regular appointment of new members as some institutions failed to participate. Committee members appears to be selected depending of their effective actuation in the basin and interest as manifested by attending the meetings (as observers) for example. HICEP has been regularly attending the meeting since 2004.

According to the minutes, the CBL is principally an information body: it is the mean for the water authority to disseminate information concerning the hydrological state of the basin and the advancement of the work in infrastructure projects. The CBL is also used as coordination body between the main water institutions, for example between HICEP and UBGL (about water demand for the next period), or between water users and dams rehabilitation project teams for the coordination of the rehabilitation work. This coordination tasks were particularly important between 2004 and 2008 when the Massingir and Macarretane dam were rehabilitated. The meeting were also a mean to monitor the development of agricultural cropping and water licensing.

Many meeting were purely informational and their discussions as reported in the documents consulted only dealt with clarification points. But along the 10 years of discussions, some crucial points have been emerging in the discussion even if they have only been discussed superficially. For example, there have questions concerning the detailed hydrological functioning of the basin (coordination between dams), the availability and accuracy of data and how to adapt of the management to these uncertainties; the difficulties raised by projects that focus only on the infrastructure dimension neglecting the other aspects of water management (institutional,

organizational and financial dimension); water tariffs; coordination between land and water licensing especially in the perimeter; partnerships between farmers association and companies; hydrological functioning of Chokwe perimeter; technological alternatives after Macaretane dam accident. However in the top down settings that prevails in the CBL, these questions were not given the importance they deserved or were even simply put aside (for example for water tariff) One can regret that the CBL is not used to assess or comment on project content before they are being adopted and the CBL is only mobilized to deal with the consequences of project implementation (and the resulting difficulties).

The conflict between HICEP and UBGL is less apparent in this second phase although the payment of water fees has not yet been regularized. The minutes underlined that the functioning difficulties of HICEP preexisted the floods, and cannot be reduced to the difficulties and delays of the rehabilitation of the dams as many problems were reported since the ending of this project.

WATER LICENSING AND WATER PRICING IN LIMPOPO RIVER BASIN
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My master thesis investigated the articulation of Integrated Water Resource Management ideas as endorsed in the "Dublin Principles" in Mozambican water sector. The research focused on two main topics: the introduction of water permits (e.g. legal entitlements to abstract water from a source issued by state agency to water users, such as licenses) and volumetric water pricing in Mozambican policies and their (side) effects on the water management practices in Limpopo river basin. Below, I will briefly illustrate the findings in relation to the impact of water permits and volumetric pricing.

As in other Southern African countries (Van Koppen 2003), in Mozambique water pricing have been tied together with a legal frameworks for water rights allocation. Indeed, both water licensing and water pricing were formally introduced in 1991 with the approval of the Water Law. The Law distinguish between common use (*uso comun*) and private one (*uso privativo*). The former refers to water uses for primary requirements such as domestic needs, watering livestock and small-scale irrigation up to 1 ha without the use siphoning or mechanical instruments; the latter to all other uses of bulk water including agriculture, industry, water supply and sanitation (art. 21). Both uses should be registered in a national cadastre. Common uses are free of charge and do not require a permit. Meanwhile, private uses are regulated by concession or licensing (art. 21 and 22). According to the law, all private uses are subjected to the payment of a *taxa de agua* [11] calculated on the basis of the volume of water consumed and type of use. The tax represents the revenue of the Regional Water Administrations. I focused on the water users that abstract water for private purposes directly from Limpopo River.

Obtaining a water licence represents a rather complicate and bureaucratic process that could last even a year. Indeed, according to the Law and the Regulation for Licence and Concessions, in order to obtain a legal licence the users should provide to the basin management unit of the regional water administration (UGBL in the case of Limpopo): personal identification, DUAT (the equivalent of land right for Mozambique), a project describing the details related with the abstraction point, the quantity of water abstracted, the use and so on. The complexity of the

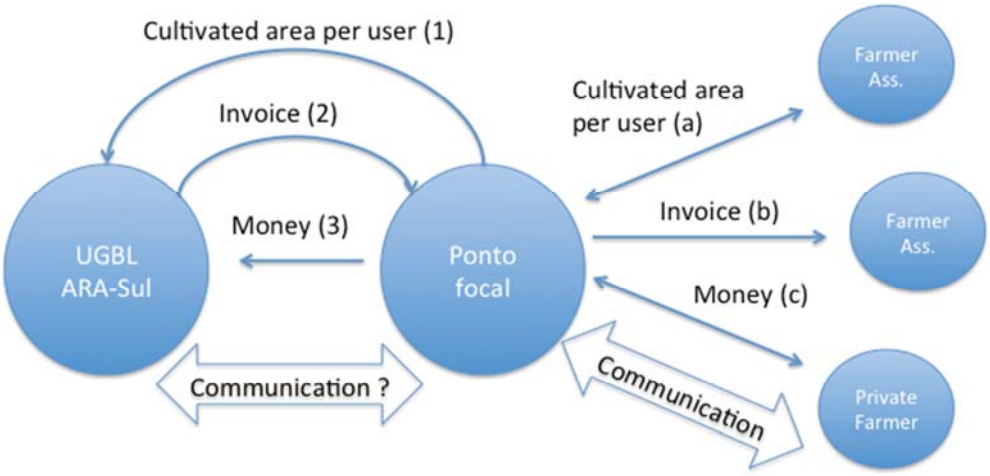
11 Literally, *taxa de agua* means water tax. Within my research I refer to it both as fee or tax.

procedure to obtain a licence increasingly affect smallholder users that are not able to meet all the requirements (e.g. they do not have a formal land right) and often cannot afford costs related with the licensing (e.g. transport, copies of documents). As soon as a user obtain a licence, he or she is formally required to pay for the water abstracted. According to the staff of UGBL this discourage poor-users as they do not want to pay (or they cannot pay).

In order to speed up the licensing process and to respond to the need to collect fees, UGBL introduced several strategies. First, the water cadastre at UGBL includes three categories of users (non-registered, registered on the process of obtaining a licence, licenced).[12] However, both licenced users and the ones on the process to obtain a licence are required to pay water fees. Second, the staff do not mention payment before the users are registered. Third, groups of water users led by one Focal Point (FP, in Portuguese ponto focal) were introduced between 2008 and 2009 in the areas where small and medium-holder users are scattered along the river banks.13

The FP functions as a connection link between UGBL and the users to improve communication and information exchange. Since 2009, 13 Focal Points have been created (5 in Massingir district, 5 in Chokwe district, 1 in Gujà, 1 in Chimoio, 1 in Xai Xai). The size of the area and the number of users administrated by a single Focal Point are variable. The Focal Point is the leader of the village or a well-known and respected man (e.g. a farmer). During a meeting organized by UGBL, he (as far as I know they are only men) is appointed by water users of a certain region as their representative. The scheme below illustrates the functioning of the focal point system (figure 1).

FIGURE 24- THE FOCAL POINT SYSTEM.



The Focal Point is in charge of carrying out an inventory of the amount of land that each user has planted and/or effectively cultivated in a specific area (a). Then, he passes the information to UGBL (1). On the basis of the data collected by the focal point, the Basin Authority calculates the water tax and issues an invoice (2). To be precise, ARA-Sul in Maputo issues the invoice and sends it to UGBL offices. UGBL staff brings the invoice to the Focal Point. The FP communicates

12 Currently the water cadastre count in total 280 users (51 cultivate between 1 and 3 ha, 207 between 4 and 30 ha). The number indicated are geographically limited to the users that abstract water from the Mozambican end of the Olifant river and the part of Limpopo river after the confluence with Olifants. At the time of the research, all the users upstream the confluence in the main river bed flowing from Zimbabwe were exempted from registration and payment.
13 Information regarding the functioning of the Focal Point were gathered during interviews with the staff of UGBL and of Ara-Sul, confronted with field visits and interviews with farmers and four focal points.

to each user the amount of money that he/she/they has to pay (b) and then collects the money from these (c). As soon as the FP has collected the money he contacts UGBL staff, which pick up the money. The Focal Point should receive a percentage of the taxes he is able to collect as reward for his service and as incentive to collect more money. However, none of the four FP interviewed have received a reward and employees from ARA-Sul and UGBL were not sure if any of the Focal Points have ever obtained a compensation.

The Focal Point system is mainly used to register users and collect fees, rather than a way to improve information exchange between the river basin unit and the users. As all the FP interviewed highlighted, often they are not timely informed when the water discharge from Massingir dam increase. Thus, they do not have time to inform the users to move their pumps from the riverbanks. Furthermore, the FP are not part of the river basin committee, a stakeholder platform that meet twice a year, thus they do not participate to the decision-making arena within the basin. Since the FP have been established only one meeting has been organized by UGBL. The meeting held in Massingir, had the objective of explaining to the FP and a group of (well-known) farmers the costs and challenges related to the management of Massingir Dam, thus showing them that they are required to pay water fees to finance infrastructure management.

In relation to licensing and payment, large-scale users are able to arrange special agreements with the regional water authority, so-called memorandum. This is the case of HICEP, the state enterprise managing Chokwe irrigation scheme. HICEP discusses an yearly agreement with UGBL/Ara-Sul. It is not clear if HICEP has ever paid for the water abstracted. At the time of the research, a second state enterprise, RBL-EP, in charge of land and water management of 70 000 hectares in the lower Limpopo was discussing with Ara-Sul a memorandum. Similarly, the third large-scale user in the basin, Massingir Agro-Industrial (MAI) a private company investing in sugar-cane production in Massingir district, was discussing an agreement with Ara-Sul. At the time of the research, due to the lack of an agreement with Ara-Sul and the early stage of development of both RBL-EP and MAI projects, were not paying. However, Ara-Sul was confident that they will start paying as soon as they will have a licence and start their production.

Concluding, within Limpopo basin the users enjoy a different treatment in relation to water licensing and payment of fees. Large-scale users are in the position to arrange special agreements with the regional water authority both in term of licensing and payment. Several strategies have been introduced to deal with the difficulties to register and collect money from the 'other' users. Potentially, the Focal Point system could improve the registration of users and the exchange of information regarding water resource management in the basin, thus improving their visibility. This is more relevant if related with the frequent occurrence of extreme events such as floods in the basin. However, currently the advantages are not fully used.

DISCUSSION - RECOMMANDATIONS

OF THE DIFFICULTY OF DEFINING POVERTY IN RURAL DISTRICTS OF THE UPPER LIMPOPO BASIN

Mabalane is not the poorest of the poor districts of the Limpopo (Magombeyi et al. 2013), yet it ranks in the 4th quartile of the poorest district of Mozambique according to the official ranking based on nutrition, food security and access to public good indicators.

In this drone prone area, leaders' characterization of poverty emphasizes the role of assets such as tillage equipment, workforce, and cattle heads. Tvedten (2010) draw attention how in Mozambique poverty definition goes beyond assets and nutrition consumption to include a relational dimension and connect poverty with vulnerability. Thus in three Mozambican vernacular language inclusively Ronga/Shangaana (spoken in Mabalane) three different words were used to design poor people that represented three categories of poor: (i) *the "destitute poor"(xiculungo) unable to maintain social relationships, only able to make short term decision to cope on a daily basis and unable to male economic or social investment in the future. This is this categories that were found old women without family, sick or handicapped people without working ability and orphans (ii) the "chronically poor" (xantumbuluku) unable to improve their live under present structural constraints (market access, vulnerability to sudden chocks) in spite of the effort and hard working. They may lack one of many different asset (land, labor, economic means to invest in alternative income sources, human capital and education, external social relationships) (III) the "transitory/transient poor" (xangam) whose situation is due to misfortunes and bad luck but with sufficient resources and social relationship to improve their conditions They are in a position to invest in future upward social mobility rather than spend all their efforts on surviving on a day to-day basis (give an education for their children, diversify income etc).*

Thus for the population poverty is the condition of a household which limits its ability to make use of the opportunities that are being offered by the environment. In a rural and distant district as Mabalane, opportunities are is predominantly related to natural resources and its access. There is a wide of natural resources to be mobilized in semi-arid district of upper Limpopo Basin: alluvial terraces land occasionally submitted to floods where flood/water recession crop and more hazardous rain-fed crop can be developed; rain-fed sandy land on higher ground; Mopani woodland with his biodiversity (fauna and flora) and wood product, the superficial water resources of the Limpopo river and (saline) groundwater. But these resources are unequally spread in the territory and the ecosystem services provided by the environment vary in the territory. Spatial distribution of ecosystem service matters all the more in a district like Mabalane than limited infrastructure and households assets or the institutional framework (LNP rules, community management rules) restrict access to these resources and exploration. Moreover employment or economic opportunities related to market or are nearly inexistent or extremely localized.

Indeed there are indication than poverty level varies between the district zones notably between (a) the riverine villages of the right margin which have access to alluvial terrace and water resources but restricted forest product and grassland surface (b) the Plateau village with no

access to superficial water but larger provision of forest and grassland ecosystem and (c) the left margin riverine villages constrained by the LNP regulation concerning natural resources. Accessibility and distance to the main market and administrative center further structure the district area. But data is missing to precisely quantify the impact of these differences on poverty.

It is well acknowledged at policy level and in policy documents that the most vulnerable groups are child-headed households, female headed households with a large number of dependent, the elderly, families with disabled members, and families living with AIDS a underlined by Magonbeyi and al (2013). Pro-poor clauses in different policies document target explicitly these groups of households.

We did not explore the relationships between poverty "naming" and poverty as characterized by leaders. It is likely that the "*Poorest*" group of our sample includes both destitute and chronically poor while the "*Poor"* group of our sample probably relate more to the transient/transitory poor. We did not have evidence of poverty strictly linked to women headed households maybe because in this area 2/3 of the households are headed by women whether in reality or in practice (when the the husband is out of the village). In any case it is likely that the two lower "income" group (*poorest and poor*) of our samples should be considered as "poor".

As inferred by people characterization of poverty, poverty and vulnerability to risks are related. Our study points out for example that flood risk was unequally imposed on households and the Poorest group even if the least equipped was those who reported the more loss of equipment. They are also have far less chicken which could be due to higher vulnerability to the commonly spread Newcastle disease because of lack of vaccination. FEWSNET study also underlined that the small ruminant mortality rate was higher for the poorest group that better-off family. Social sciences studies have long underlined that risk are being unequally imposed upon society (Tierney 1999, Bankoff 2007) and that vulnerability cannot been reduced to the exposure to hazard. Thus The work on political economy, notably the Sen's seminal work on food security (Sen, 1981) have explained the role the social mechanisms of vulnerability that is the role of inequality and difference in economic and political power in the building of vulnerability. Consequently the most vulnerable groups are not those how are the most exposed to hazard due to geographic, environmental or technological or capacity reasons but those whose rights and entitlement, and/or empowerment levels are the most limited in society.

While poverty is created by historical process which deprived actors to resources accesses, their vulnerability results from a lack of means to overcome, to anticipate or recuperate from different types of perturbations (Bankoff 2007). Vulnerability studies in semi-arid areas underlines that health and security issues, unemployment, access to potable water are considered are more important risk factors than natural hazard including drought (Aalst, et al. 2008). The strategies developed results less to an adaptation to rain variability than a diversity of dynamics and interaction and it remains difficult to differentiate decisions and practices which responds to adaptation of the different types of events that can be from social, political, economic or environmental origin (Ziervogel et al. 2006; Tschakert 2007).

WHAT APPROACH TO REACH THE POOREST AT COMMUNITY LEVEL?

At village level, our study confirmed the existence of mechanisms connecting the poorest people and the better-off and the resort of mutual help systems where families exchanges work against small gift, access to equipment or money. They have a limited impact: the most vulnerable are also the most short of labor availability and the least able to reciprocate.. They are mostly

resorted to on occasional basis allowing families to cope for occasional shortage of labor or income. Yet in this little monitarized village remuneration is limited and sometimes more symbolic than significant.

External interventions toward the poorest groups are also of limited scope in time and space. Apart of the INAS subvention system which reach 13 % of the district households at the moment most of these interventions aimed to support households to cope with extreme climatic events notably drought and flood which plague the area. INAS and NGOs favor targeted approach while government response usually mobilizes the prevailing hierarchical administrative organization that structures the district from the technical services to the villages.

At village level village responsibility or party membership increased the likelihood of benefitting from this government interventions but the poorest households can be included in related scheme. The proportion of households from the poorest group included in this type of scheme varies in each village which draws attention to the gatekeeping role of leadership at community level. Targeted interventions are more efficient and in practice help correct the shortcoming/ flaw of administrative distribution mode but are not void of elite capture.

Globally villagers favors "blanket" approaches (intervention that reaches all households) or development options which benefit the community as a whole (public good orientation) and in first approach tend to refuse targeted intervention toward a specific vulnerable group. There are two reasons for this: indeed, there is highest chance for all poorest households to be reached in a "blanket" intervention than with a targeted or limited scope intervention where elite capture is a real risk as underlined. Beside villagers look to avoid the poisonous effects of jealousy and envy that spread conflicts at community level. Yet, perception concerning equity suggests that there is a margin for targeted intervention reaching certain categories of vulnerable providing a good a posteriori control. These approaches can be acceptable to the households middle wealth village elites should be involved in the target indicators and a posteriori control of recipients be undertaken to guaranty transparency.

Interventions for innovation dissemination often developed in the name of poverty alleviation may contribute to further exclude the poorest of the community. As underlined villagers tend to reject options that directly benefit or are being controlled a limited number of people as they generate envy and internal conflicts in the village. This includes "demonstration" scheme for new technology (agricultural demonstration, tank cistern etc) which is perceived as a favor toward the beneficiaries. If equipment of infrastructure demonstration are to be developed, it is probably best to target either school or health centers premises, taking care prior to intervention to clarify the uses and access arrangement at village level. For agricultural demonstration one should strive either to see how a large number of people could benefit from the scheme (number of demonstration plots, redistribution of outcomes etc).

Most of the irrigation association was created as part of a drought alleviation project. Although some private farmers can generate income from small irrigation, for most people small irrigation is a drought relief mechanism aiming at compensating a poor rainy season. But their high functioning cost and the limited local food production market restrict the economic sustainability of this system especially for smallholder association who has not only to master technical and economic management skills of irrigation but the coordination process (and related transaction cost). The coordination skills necessary to share water and maintenance of the equipment are systematically discarded or undervalued by external intervention which either assumes than collective action is a given characteristic of communities or do not even acknowledged it as an issue. In Southern Africa hierarchy is the norm and functioning self-help group or associations are rare. They require "organizing skills, capacities to communicate and

learning to trust people and are likely to revolve around the quality of local leadership (Cammack 2012).

Yet technicians are ambiguous on the role and potentialities of small scale irrigation: they tend to underestimate the skills that allow for the (fragile) economic success of the well-connected experienced farmers and entertain a false representation of irrigation limited to its technical dimension at the most, rarely including its economic one and never the social and political dimension of collective irrigation. It has not been possible to complete within this study an analysis of the sustainability of the five different irrigation governance model identified in the area. In any case we recommend that the development of irrigation association be accompanied by actions taking into account not only the technical and economic dimensions of irrigation but also its social and coordination aspects. Economic activities include market opportunities analysis understanding that the geographic localization of these distant little populated and undeveloped upstream districts will always limit market opportunities.

Innovation by definition involves practices changes. But practices of any kind are rarely purely technical but often involve a social and political dimension: consequently innovation so also changes entitlements (land and water access for example) which may affect the fragile balance on which poorest households survive. This is the case of the development of subsidies for private small scale irrigation through OIIL funds: It has changed the status of irrigable land from a public good (for collective food production during the hungry gap period) to economic resources (income generating activities). It led to the renegotiations of land tenure arrangement which benefited associations.

Indeed in spite of being advocating as a poverty alleviation mechanism, OIIL funds is being captured by district elite and higher village elite and have very limited direct or indirect positive impact for the poorest at village level. Yet project geared toward small animals breeding such as small ruminant or poultry (associated with veterinary support) could have handled by villagers. Indeed Few if any interventions target small ruminant breeding or poultry which are essential for poor people: breeding (goat or cattle) is globally an activity more valued than irrigation for food security objectives.

One of few assets of poorest people is their labor force but even their labor is limited. It is remarkable for example than the poorest people are the least likely to revert to free river water when confronted to paid saline borehole water, either for lack of mean and time availability. Consequently development options than relies on labor are not likely really benefit the poorest. This is the case of conservation agriculture in the condition of semi-arid Limpopo. Conservation agriculture is being advocated as a solution to enhance water productivity of the drought prone area of the Limpopo basin and is being promoted for most vulnerable people along with strengthening institutions (Sullivan and Sibanda 2010). Yet results in the upper Limpopo Basin underlined a limited success for conservation agriculture (Midgley et al. 2012). In the overall there is evidence that adoption of conservation agriculture have been with related with the adoption of a package that subsidizes inputs fertilizers (Andersson and D'Souza). Indeed subsidized access to fertilizers is one the preferred options in our survey. Beside no tillage agriculture is associated with increased labour requirements when herbicides are not used, an important gender shift of the labour burden to women; Other limit includes the competition of livestock feeding on crop residue with mulching. (Giller et al. 2009).

This does not mean that one should forgoes innovation but acknowledge that their main beneficiaries could be the better-off of the communities or that they could further exclude either directly or indirectly by changing entitlements concerning resources (land, water, forest, labor) arrangement on which the poorest derives their livelihoods. But the inevitable changes

accompanying innovation could be supported by the extension of safety nets mechanisms, as targeted food aid, safety nets, inputs/outputs subsidies (Magombeyi et al. 2013)

Indeed the role of safety nets in poverty alleviation is now well acknowledged with for example the role Brazilian conditional family transfer ("*bolsa familia*") in poverty alleviation for example although some contest them as a way to support dependence mechanisms. What kind of safety net could be implemented in Mozambique? INAS plans to expand their subsidies for the most vulnerable. But other argues than a universal blanket subsidy for aged people or children would not not only alleviate poverty but increase village monitarization and thus economic development opportunities at village and district level (Hanlon 2009). Indeed, long before of the implementation of the "*Bolsa Familia*" program the generalization of the agricultural retirement pension to rural area and family farming sectors (*rural aposentadoria*) in the late 90's had a positive impact in Northeast rural economy and poverty alleviation (Maia et al. 2008; Soares).

IN SPITE OF THE PRONASAR OUTCOMES, WATER ACESS REMAINS A KEY PREOCCUPATION

PRONASAR have indeed increase the number of functional water points in the district, a positive outcomes acknowledged by all. Yet (domestic) water access remains a key preoccupation for villagers even in communities which directly benefited from PRONASAR intervention. One reason is that salinity risk of groundwater in the upper Limpopo basin is high. The average salinity level in boreholes in the district is superior to the accepted salinity norm. Consequently some, especially those with transportation and labor availability still uses river water in spite people acknowledging its lesser hygienic quality. The survey also underlines that the "comfort" zone for boreholes by inhabitant is well below the 300 level retained by the government. For people this "comfort" zone is closer to100 households by borehole.

So water access is still perceived as limiting and villagers are divided on the value of saline boreholes. Salinity is an issue not only in term of water quality but because it constraints uses and sustainability of SWI. Maintenance of saline boreholes depends of the added value of the borehole in the village compared to other water sources. There is indication that salinity in boreholes can also evolve rapidly. It appears necessary to better understand the dynamics of salinity in groundwater in the area. Although more expansive, a systematic assessment of the hydrogeological profile prior to drilling campaigns and systematic monitoring of the evolution of water salinity could contribute to a higher sustainability in water points in the very challenging environment of the Upper Limpopo Basin. Focus group also indicates that in vernacular languages two different words were used to specify boreholes water quality (one was translated by saline and the other in bitter) and this difference could be interesting to investigate.

Due to the salinity level and its importance to longer term maintenance and the drilling cost, it is necessary to explore the development other type of infrastructure than boreholes such as small water system pumping from the river or small reservoirs. As pointed out by district technician, this latter options are probably the only solutions in some Plateau area of the district. This type of infrastructure have however own specific constraints which have to be presented and debated openly with the population. There will be a need to develop water treatment in multiple-use reservoirs with consequence on management complexity and water tariffs. Pumping also increases management costs which can be a limiting factor as the difficulties of the small water system of Chinhequete shows it. Pumping equipment can also be vulnerable to flood and drought.

Borehole sustainability is perceived without doubt as a local or community issue but the role of water committee in management is unclear. Sustainability appeared less a matter of governance organization than of the ability of the leadership to mobilize the community. It seems that the articulation between the key committee members and the village governance level is more important for SWI sustainability that proper normative functioning of the committee. A more detailed comparison of committee and village governance functioning between villages would be necessary to clarify the mechanisms involved. Here again the centrality of leadership for collective action seems to prevails against the westerner concept of self-help and organization (Cammack, 2012). What is at stake is better identify the prevailing popular representation of what is good leadership. It appears that any intervention that weakened cohesiveness and enhance village leaderships conflicts for example intervention with lack of transparency or intervention reaching a limited number of villager weakened coordination processes or collective action capacity and consequently SWI sustainability. In other word what matter is the good fit between village governance and the water local governance system rather than "committee best practices" (Booth and Cammack 2013a).

60 % of villagers declared paying their water fee in time which was coherent with book data in one village. But clearly the poorest tend to later in paying their fees which highlight the need of having villages defined their own social tariffs. Although included in the PRONASAR program the pro-poor dimensions have the program have not been explicitly implemented and any existing pro-poor attention related to water access at village level derives from NGOs initial intervention in the 90s. On this basis the money easily avalaible at village level for boreholes maintenance varies between 5000 to 12000 MT depending of the number of boreholes users. Consequently, a threshold of 10000 to 12000 MT for state intervention could be recommended and a corresponding sum included in annual SDPI budget to allow rehabilitation or repair out of the reach of villagers. .

The results of this work calls for adapting PEC interventions at village level and the building of technicians' capacity to be more sensitive or aware of social and political dimension of (water) infrastructure management. In a "well-organized and leadered" village one might relies on a lighter approach focusing on structural dimension of water points sustainability (short term management and maintenance training session etc) while in conflictive situation a long term accompaniment would be necessary focusing on transparency (making sure that information concerning water tariff collect money management are held regularly for example) and monitoring dimensions. At last, time is a key constraint in village and management should alleviate as far as possible time requirement for management. This includes minimizing the "bureaucratic" functioning of borehole management to the strict minimum while allowing transparency. A review of management document is necessary starting by the document effectively in use by village leaderships and committees.

At last, sanitation is not considered as a top priority at village level but there is indication that connection of sanitation with the development of water access has had positive outcomes. At least, interviewed underlined some knowledge of different hygienic quality of water from different source. This non-priority intervention has to be connected to other desired intervention to be successfully developed.

As underlined district territory are not uniform and territorial and ecosystems inequalities needs to be fully understood and acknowledged to be corrected or to avoid reinforcing existing inequalities.

In the past project based approach, politicians interference and/or top down pressure for accountability have increased the spatial differentiation of poverty as area with easier access or higher chance of success where more likely to be targeted than others. The District government in Mabalane is now striving to try and promote a more equitable spatial development. Yet there are still large differences between areas. Besides the functioning of district technical services are still very much shaped by aid and politicians interference. This tends to fuel the vicious circle of island of development in the ground, and may weaken civil service compliance to regulations in the context of pocket of neo-patrimonialism[14].

Donors, which submitted to the questioning of their constituency put a large emphasizes efficiency based on outcome indicators (for example number of boreholes build or number of irrigated scheme installed); They also have to show results in short term frame. They do not give enough importance to the quality of the implementation process which as underlined plays an important role in the sustainability of their intervention. There is a need to enlarge the set of indicators used by project, program or policies monitoring in order to better account for to the quality of implementation. For example, project could refer to the number of reference of the project in Consultative Councils meeting minutes, the number of transcription in village book (for water tariff) collect or the number of farmers effectively involved in irrigation for each moto-pump.

As the place where different rationale and perspectives on equity (politicians, technical and community) can be confronted, debated and branded, Consultative Councils should pay a larger role in the allocation of mean and in the district, post and locality planning process. They could also be involved in deciding for example allocation criteria of benefit of the different interventions and thus promoting a more transparent approach to this project based development. Latest findings underline that efficient solutions for public good management are often '*practical hybrids' resulting from conscious efforts by elements of the modern state to adapt to local preferences and ways of doing things* (Booth 2012). They also underlined that '*bottom-up pressures to perform have little impact in the absence of politically-driven policy coherence and top-down discipline*" as a way to discipline the functioning of technical services to go beyond the capture of aid and program rent to foster impact on the ground . In this perspective Consultative councils must not be viewed as the expression of citizen's bottom up demand but the place where the top-down logic of Mozambican government can be confronted with local ways of doing things in order to build local adapted response.

Water is only one of the natural resources mobilized by villagers for their livelihoods along with crop land, forest product, and grassland area. There are direct connections between natural resources product. For example irrigation is often funded by charcoal making or the localization of water resources determines grazing area and fuels between farmers and herd owners and

[14] **Neopatrimonialism is a system where patrons use state resources in order to secure the loyalty of clients in the general population. In other word a system where officials occupy bureaucratic posts less to deliver public goods and services than to acquire personal wealth and status.**

even restricting irrigation. Beside some resources are clearly being explored unsustainably, as the charcoal making in Massingir which has led to a 5 year ban of this production, the major income source of livelihood in the district. The PNL restriction over natural resources exploration also constraints livelihood and probably make the poaching all the more appealing.

Consequently the development of the district including of SWI cannot be disconnected to the integrated management of natural resources. Planning must take into account not only the links between the different resources and their related infrastructure but also the relationships between the riverine and Plateau area, the food security mechanisms and other development instruments such as OIIL; What is at stake is (i) promoting the cooperation and coordination between the several organizations and actors that in practices orient public good management (ii) use the different district management instrument (PESOD, OIIL, INAS subsidies, project interventions, 20 % funds for natural resources etc) to support the strategic line of development taking into account their impact of overall natural resources at district level. A pilot activity have thus been initiated with the district government, technical services to develop a planning discussion tool in a form of a simulation non computerized model representing the natural resources management in two villages of the district. The tool is being tested with consultative council as a way to engage a debate concerning integrated planning.

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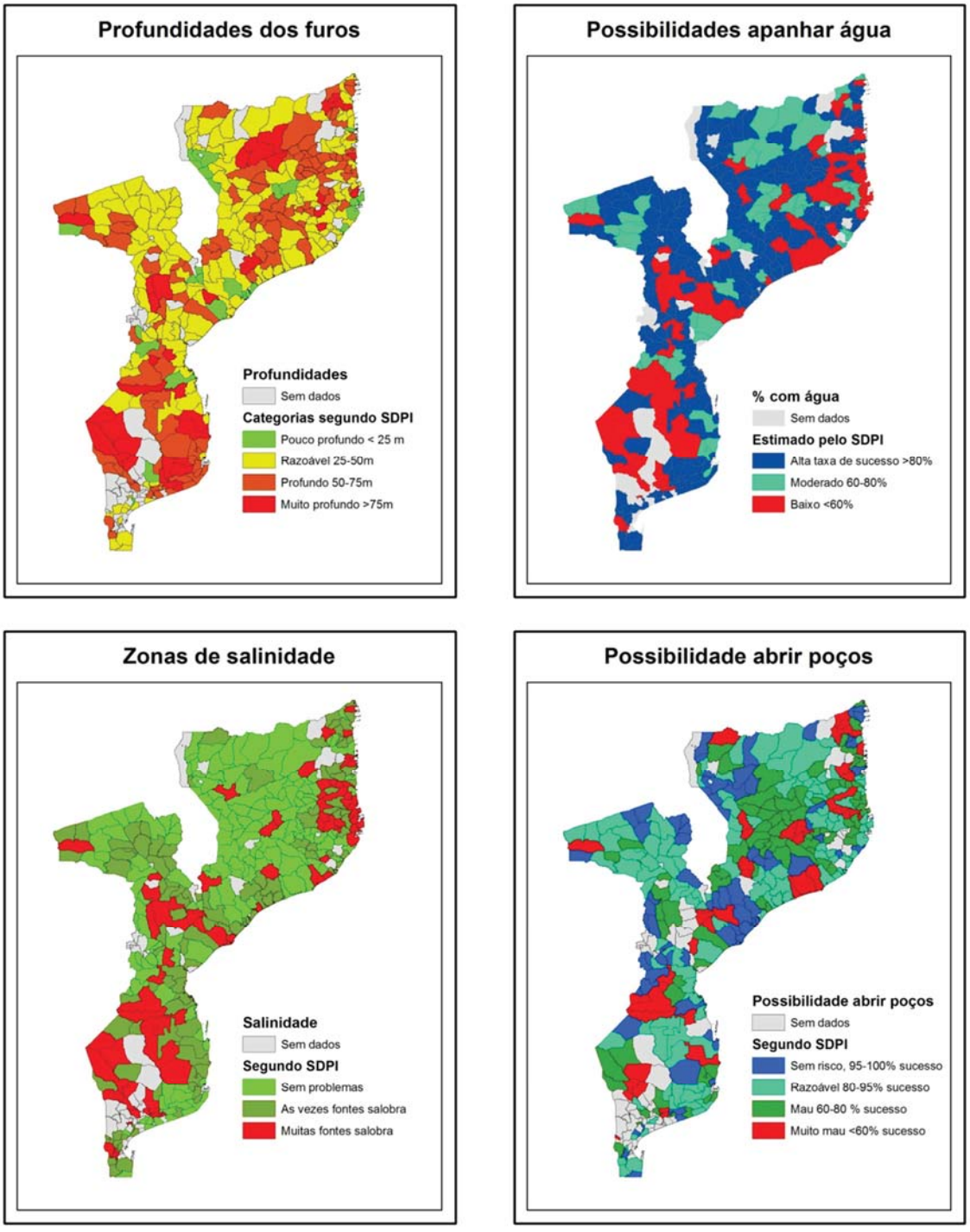
ANNEXES

ANNEX 1. MAPS WITH HIDROLOGICAL DATAS (SOURCE MOPH/DNA 2013) ELABORATED BY WE CONSULTS



ILLUSTRAÇÃO: MAPAS COM DADOS HIDROGEOLÓGICOS

ANNEX 2: PRONASAR, A NATIONAL PROGRAM FOR WATER AND SANITATION DEVELOPMENT

The National Rural Water Supply and Sanitation Program (NRWSSP), or PRONASAR (Programa Nacional de Abastecimento de Água e Saneamento Rural) is a program that "aims to align and harmonize activities in the sectors, financed through various modalities by various actors such as Government of Mozambique, development partners, non-government organizations etc (Pronasar 2009)". It is thus "the framework for operationalizing and implementing the Rural Water Supply and Sanitation Strategic Plan (PESA-ASR) 2006-2015 to reach the Millennium Development Goals target of 70% coverage for rural water supply and 50% coverage of rural sanitation at national level, respectively". This implies the provision of 17 000 new or rehabilitated water points and 151 small rural systems (Pronasar 2009): In Mabalane 30 boreholes per year are planned to be develop during 3 years as part of the first phase (2009-2011).

The program was officially initiated in 2010. Apart allowing for a better access to water and sanitation access in rural Mozambique, the program aimed at correcting the discrepancies in the water coverage between districts and provinces and promote capacity building in the WASH sector at local level. The program has four components (1) Support to sustainable increase in rural water supply and sanitation coverage (2) Development of appropriate technologies and management models for RWSS (3) Capacity-building and human resource development in the RWSS sub-sector (4) Support to decentralized planning, management, monitoring and financing of RWSS.

Concerning this latter components, the program explicitly state that it will promote and support inclusive, bottom-up planning, improving the accuracy, completeness and communication of information for planning, budgeting and managing rural water and sanitation. The Program will also promote and support complementary cross-cutting approaches such as poverty alleviation, good governance and gender equity.

The planning for PRONASAR water infrastructure within the program was supposed to be closely linked to the district planning process and involve the Consultative Councils. This included to implement district Water and Sanitation plans with decentralized resources, including the Common Fund, DPFP and other government and non-government resources, prepare/update and implement provincial water and sanitation master plans and district water and sanitation plans, Promote, implement and monitor district and local participatory planning, develop the SINAS (data based on water and sanitation developed at Provincial level) related databases operational at central, provincial and district level. Joint sector reviews, assessments and audits conducted and recommendations implemented.

"The National Directorate of Water (DNA) is responsible for implementing the Program at central level. The Provincial Directorates of Public Works and Housing (DPOPH), through The Department of Water and Sanitation (DAS), is responsible for implementing the Program at provincial level. At district level, district governments through the units responsible for rural water supply, sanitation, community mobilization and health promotion will be responsible for implementing Program activities. At local level, Community Water Supply and Sanitation Committees composed of village residents are formed and supported to assist in planning and to manage, maintain and monitor improved water supply and sanitation facilities".

The PRONASAR has an explicit component dealing with participation and the most vulnerable groups. As stated "In accordance with the Demand Responsive Approach (DRA), communities will be encouraged to express their priorities and demand for improved WSS services, play a central role in planning and implementing activities, and choose how they want to manage and

pay for operating the completed facilities in a manner which is pro-poor and gender sensitive… The poorest and most vulnerable groups are identified as female headed households and vulnerable groups, i.e. elderly people, people living with HIV/AIDS, dis-abled or people with chronic diseases… Three monitoring indicators of the program are directly targeting its pro-poor orientation: Incidence of poverty in village (% poor household), % water sources maintained by communities with pro-poor management rules and regulations, % of poor areas and households with access to water and sanitation.

The pro-poor approach includes a priorization of district and district area to develop the program's activity areas using poverty and equity indicators; prioritization of areas with low coverage and high poverty, and promoting the active participation of women; the use of participatory district planning methods and promoting traditional systems of social support to reach the most vulnerable group; building and use of poverty maps or areas with lowest coverage a identified during the Phase I of the Program; making use of the participatory planning mechanisms at district level (from local development committee to District consultative council) for the participatory prioritarization; capacity building "*notably for women on building self-esteem, strengthening capacity to analyze problems and make equitable and gender-sensitive decisions, and capacity to negotiate, argue and persuade directed*" to be developed notably by NGOs.

As stated in the project document the selection process is expected to follow the following approach: 1) identification of priority areas; 2) community mobilization and demand generation, and 3) final selection of communities, as follows:

- First, at a general meeting, community members discuss and agree on priority areas using agreed selection criteria54, including population size, availability of water sources, incidence of water-borne diseases, poverty and prevalence of HIV/AIDS.

- Communities' willingness and capacity to participate in and contribute to the improvement of their water and sanitation services will then be assessed and verified.

- Communities that meet agreed requirements will be selected to be included in the annual district implementation plan, subject to the availability of resources, on a first come-first-served basis.

Selection of communities has to be conditioned to the respect of some conditions: up-front contribution in cash or in kind; formation of a water and sanitation committee, payment of full operation and maintenance costs, etc. will also be presented, discussed and agreed

The program also implies to promote local income generation and productive uses of water through mobilizing FDD funds and recommend using local mutual assistance mechanisms for dealing with specific cases of vulnerability. It explicitly promotes the participation of micro-entreprise in providing various water related services and hygiene and sanitation products, promotes work with small-scale contractors, suppliers and individual artisans in order to develop districts capacity ("capacity to plan, undertake procurement, supervise construction, manage contracts, inspect and certify works and monitor progress").

Although the National Directorate of Water is recommending the AFRIDEV hand pump, the program will support testing and certification of alternative hand pump designs suitable for varying depths and water quality DNA will be expected to approve recently tested pumps, such as the Rope Pump, Playpump, and the Afrideep (see ANNEX 4 for presentation of the different pumps).

The program also plans for the establishment of a water district forum which would be set up as subcommittee of the district Consultative Council to discuss all issue related to water at district level.

ANNEX 3: THE DIFFERENT TYPES OF MUTUAL HELP AS IDENTIFIED IN THE LITERATURE

Temporary migration in case of hunger	
Kukathekela (Kutekhela)	• move temporarily to another area to work for food (resort to kin living in better area) (Brouwer 2006) • During hungry period, one person or a group of people from the affected area move to an area non affected by hunger to ask for food and seed (Vuma 2004) • Individual of a given village suffering from lack of food move to another area where there is food to work temporarily in the field in exchange from food (Dava et al. 1999)
Exchange involving work against some kind of payment	
Kurimela	• One individual goes and works in the field of other and received a symbolic gift in exchange (Vuma, 2004) • One individual in need of income offers his work temporarily for a specific activity in exchange for money, food or other goods. Normally this are agricultural activities (ploughing, weeding, sowing, harvesting) (Dava 1999) • Individual formal labor exchange - work on somebody land in exchange of ploughing - (Brouwer, 2006)
Kurhimelissa	• Households that necessitates supplementary workforce/labor temporarily contracts workers for a specific work: It is Kurimela from the point of view of the labor contractor (Dava, 1999)
Tsima	• One individual or household needing a large amount of supplementary workforce for his fields or other non-agricultural activities invite people of the community to. In exchange the receiving family offer foods and drinks (alcoholic or not). This end in a fraternization party (Dava, 1999) • It is the realization of a punctual operation which need a lot of workforce, followed by celebration (which include a large amount of traditional drink and food to those who came to help) (Vuma, 2004) • Group arrangement where food or alcohol are exchanged for farm labour (male group) : help rebuild house, or replant field after drought (Osbahr, 2008)
Matsoni (Tsoni) - Xivunga	• Activity which consist in two people being link by a friendly relationship which exchange workforce in their field, alternating work in the respective fields. This form of mutual help has been evolving toward the paid work in the field (Dava, 1999) • Informal exchange between women, which evolved toward a more formal self-organized network (is a guaranty that dryland plot was planted (Osbahr, 2008)
Kupfunana (Tsone)	• It is a rotating system of workforce/labor in which there is no need to offer drinks or food to participant. This type of mutual helps is generally organized by poor villagers (Vuma 2004)

Other type of working exchange	
Mugwazo	• In use since the colonial time it is a type of agricultural seasonal work non compulsory based on the payment for surface unit worked.

	(Vuma 2004)
Ganho Ganho	• Individual that need a source of income offer his work temporarily to other in exchange of money. It's normally deal with any type of work (agricultural, water transport, well digging, house building etc). it is generally paid in money. (Dava 1999) • Refers to exchange of work against food or salary (Silva et al. 2010)
Exchange involving cattle or animal	
Kuvekissa	• outplacement of cattle (to keep livestock in somebody else homestead) (risk diversification strategy) and reciprocity with the same service (Brouwer 2006)
Kukusela	• provide heard man of boy in exchange of cattle (Brouwers 2006)
Kuvekela	• Look after other livestoch to heep the first born as paiement : protect social norm including inspiration of livestock ownership and strengthen trust with community within the ideal of equity Increased since 92 (Osbahr et al. 2008)
Kuvekelissa	• Activity in which on individual or household da his animals to be guarded by another family which do not have animals and want to intiate breeding activities, or to a family which is specialized in animal breeding. The person two take care of the animal is entitled to receive part of the offspring during the time in which he was in charge of the herd (Dava 1999)
Kuvekelisiwa	• Kuvekelissa from the perspective of the one that receive the animal to guard.
Other type	
Kukashela	• Pooling farming tools (reduction of investment at community level (Brouwer, 2006)
Mbelelo	• A group of elder women of an area meets and walk naked and saying insults in the fields insulting as a a form of pest control (Vuma 2004)
Xitique	• A traditional and informal saving and credit system that do not include the concept of interest, based in a trust relationship between people build around friendship or professional relationship. (Dava, 1999)

ANNEX 4: INAS WATER RELATED ACTIVITIES IN MABALANE DISTRICT

INAS[15] is in charge of the development of social security program and activities in relation with absolute poverty alleviation, among which basic social direct subsidies, direct support to older people and orphans children, assistance to disabled people, and food security program based on a Food-for-Work scheme. In 2012, basic social direct subsidies concerned 718 families (13 % of the families) which receive monthly between 130 and 380 MT[16] depending on the number of dependents. Eight villages were selected jointly with the district administration to receive this program, all of them located on the right bank of the river and mostly in the Mabalane Administrative Post. It targets mostly elders people notably widows, women head of families with a large number of dependent and head of family with chronic disease. There was no direct links with water access but this program provides a secure monthly income even if very small to a very limited number of families

In 2012 a new pilot program supported by PMIA and World Bank is being implemented in 11 communities of the district (Right bank of the Limpopo River mostly Mabalane-Sede and Combumune). This program which lies on a Food-for-Work scheme aims to provide food to selected members of the communities against the development of activities of common interest for the community. NGOs are expected to help communities to propose and submit projects. Two types of project could have direct links with water: building or maintenance of small reservoirs and production of bricks. Yet at this stage none have been planned in this district. Most projects proposed relates to the cleaning of road, the development of fruit tree plantation or tuber crops (sweet potatoes, cassava). Yet in the past some village have rehabilitated small reservoirs through Food-for-Work schemes within drought relief interventions. INAS had also supported the development of two small collective irrigation systems in the district[17].

[15] **Instituto Nacional de Ação Social – National Institute for Social Action**
[16] **Between 3,25 and 9,5 euros/month**
[17] **These initiatives had not been mentioned by INAS staff. Their development may have been linked to specific drought relief program, to be clarified.**

ANNEX 5: INSTITUTIONAL FRAMEWORK OF THE DISTRICT

The district government relies on a hierarchical structure which ranges from the district to the village (following table). The FRELIMO party also has its own hierarchical structure, from the district level to each community.

THE DIFFERENT LEVELS OF GOVERNMENT AT DISTRICT LEVEL

Administrative level	Person in charge	Related services	Interface with civil society
District	Administrator	Various services among which: *SDPI (*Serviço Distrital de Planeamento e Infraestrutura* or District Service for Planning and Infrastructure): in charge of works and development of infrastructure (road, water infrastructure), planning and environment *SDAE (*Serviço Distrital de Agricultura e Actividades Economicas* or District Service for Agriculture and Economic Activities) : development of agriculture (including irrigation, fishing, cattle breeding), wildlife, charcoal production and economic activities Secretariat of District : planning; organization of Consultative Councils	The Consultative Council (*Conselho consultative do distrito*) gathers some village leaders and member of civil society chosen by the district government
Administrative post (3) ("*posto administrativo*")	Post chief "*chefe de posto*"	Local decentralization services with aggregated services and local civil servant	The Administrative Post Consultative Council (*Conselho de Posto*) gathers some leaders and members of civil society of the administrative Post
Locality ("*localidade*")	Locality chief "Chefe de localidade"		In each locality a council of leaders gathers 1st scale leaders and 2nd scale leader

ANNEX 6: LOCAL CONSULTATIVE COUNCILS AND LOCAL DEVELOPMENT FUND

The institutionalization of local consultative councils[18] has been one of the most important political reforms at local level of the last 15 years in Mozambique (Forquilha 2011, Pereira 2011). They were first experimented in the North of Mozambique in the framework of participatory planning project with support of external donors. In 2003, these Consultative Councils were institutionalized with the *Lei dos Orgões Locais do Estado*[19] (LOLE) approved in 2003 (Lei 8/2003) and its regulation (Decreto 11/2005). Consultative Councils are established at the different level of district administration that is at district level, post level and locality. The District Administrator is responsible for establishing the consultative councils and the districts have budget to convene the meetings. In practice the general secretary of the district is in charge of councils. Each consultative body is expected to held two ordinary meeting a year and as many extraordinary meeting as necessary.

Their composition established by this latter regulation is based on representativity with at least 30 % of women.. These councils can range in size from 30-50 members at district level to 10-20 members at locality level. In practice they gather '*government, community leaders, secretaries of the FRELIMO party, civil society notably farmers and fishermen, health agents, education workers, influent individuals, religious leaders, representative of the private sectors , members of OMM (Mozambican Women Organization), OJM (Mozambican Youth Organization), ex-servicemen'* (Forquilha 2011)

Consultative councils are being associated with the process of decision making at district level notably to local planning. By law they are to be involved in the process of elaboration and approbation of the district plans either the District Strategic Development Plan or *Plano Estrategicos de Desenvolvimento Distrital* (PEDDs) elaborated on a 5 year basis and the annual Economic and Social Plan and District Budget Plano Economic e Sociais e Orçamento Distritias (PESOD) (Decreto 11/2005). These plans are important for water as they detail the infrastructure investments for the next year (PESOD) and 5 years terms.

Consultative councils by law also play a key role in the selection of project submitted the *Orçamento de Investimento de Iniciativa Local* (OIIL) also *called Fundo de Desenvolvimento Distrital* (FDD or Local Development Fund)[20]. Introduced in 2006 this fund aims to reduce poverty by funding individual projects of food production and generation of income and jobs by offering a credit opportunity to local people excluded to formal credit system. The total interest rate is 5 % but there is no strict rule for reimbursement. The few systematic studies on this initiative have underlined non surprisingly the larger access of local established elites to the fund and the global failure of reimbursement of the loans (Forquilha 2011, Pereira 2011). They also underlined the relationships between membership and structure of power of the district, notably of the dominating political party.

Mabalane is one of the 8 districts whose budget implementation is being monitored by the *Centro de Integridade Publica* (the Center for Public Integrity) an NGOs that promote "integrity, transparency, ethics and good governance in the public sphere" through qualitative research and information of the public. It indicates that within the 2010 OIIL the district received 6.742.800,00 MT allocated to 85 projects. 33 % of the project were dedicated to agriculture production, 58 % for creation of jobs and income (this includes commerce, agro-processing,

[18] Different names in Portuguese : Conselhos Locais (Local Council), Conselhos Consultativos (Consultative Council), Instituições de Participação e Consulta Comunitária (institutions for ommunity participation and consultation)
[19] Law on Local State Bodies
[20] Locally known as "7 milhoes", the seven millions program/fund.

small industries, transportation etc) and 9 % for cattle breeding. 28 % of the project leaders were women. It questioned the value attributed to one of the project over the 800 000 limits of the FDD functioning rules, underlined that the projects with the highest level were submitted by civil servants, underlined that 23 % of project were dedicated to public semi collective transportation which presented problem 2 months after being bought. Beneficiaries signed a contract with the district before receiving a cheque[21] and received a copy of this contract. The contract included the devolution period and the number of payment. But did not specify clearly how the payment was to be done. (CIP and LMDH 2012, 2011)

Since then more specific rules are being applied to the fund with strict limit to project depending of their activities, focuses on food production projects and small income generating activities.

	Mabalane-Sede	Combumune	Ntlavene
% of allocation by post (CIP and LMDH 2012)	39,4	29,8	30,8

THE ROLE OF CONSULTATIVE BODIES AND POLITICAL MEETINGS ("*COMICIO POPULAR*")

The District secretary is in charge of the organization of council meetings paying for example for the transport of village representatives and occasionally other expenses (meals etc). Even if their transportation costs are being compensated travelling can be an issue in an area where there is no regular motorized transportation outside of Mabalane market day[22].

The leader council (locality level) gathers **all** 1st scale and 2nd scale leaders of the locality. The council level at post level and district level gathers representative of the government, some civil servants (teachers, nurses), designated leaders and designated members of civil society (representative of local organization or individual with acknowledged economic or social activities). Members are coopted and designated by the council to fulfill the theoretical compensation of each council as defined by the law (numbers or percentage of women, number or percentage of representative of civil society etc). How the selection is being done has yet to be clarified but council minutes underlines that council membership are updated in nearly all councils.

While civil servants and technicians most of the time align with the political position as defined by high level (party related) civil servants, some representatives of civil society may have more independent positions, question activities and programs of the district services and raise relevant questions. At post and locality level, consultative bodies have a more top-down functioning, focusing on disseminating district government information and often perceived as an educational forum for leaders.

Government officials are supposed to visit their constituency on a regular basis and hold meetings with the communities in order to have direct interactions with villagers. The number of the villages makes it difficult for the administrator to visit each of them more than two times a year even by following a strict monthly visit routine. Post chief visits to communities are irregular and most of the time connected to a higher level visit (Administrator, Provincial or National level visit). Thus only the locality chief has a more or less regular interaction with communities and villagers. It derives that information to villagers transit most of the time

[21] In other district, beneficiaries do not receive directly money but the district has agreements with some retailers.
[22] Every Thursdays. During other week days it is possible to be picked up one on the Chokwe– Mabalane- Mapai road, notably if you arrive early enough on the road but most villages are located far away to this road (more than 10 km sometime around 40 km). Ntlavene villagers have also to cross the river to reach Mabalane.

through local leaders and discussion at village level underlines a general lack of transparency of many issues at village level.

This consultative system is completed by visits from government and/or party officials from provincial level (governor, department level or party) or national level (ministries, presidency or party) either as part of monitoring the implementation of national policies or local administration. At least one "high level" visit can be expected each year in each post which generally includes some field, new equipment and/or village visit. These visits are important political events where local administrative and technical staffs strive to present their activities at their best and visitors want to prove their ability to answer local demand. Consequently the preparation of these events mobilizes the different level of district government (from district to village) and services, and this directly interferes with project and program development: the building of specific infrastructure might be pushed up to be ready for a specific visit without taking the adequate time for consultation and training of beneficiaries.

ANNEX 7: THE LIMPOPO NATIONAL PARK AND THE COMMUNITIES OF THE PARK BUFFER ZONE

A large part of the Ntlavene administrative post and some villages of the Combumune administrative Post lie within the limit of the buffer zone of the Limpopo National Park (PNL-*Parque Nacional do Limpopo*). In total 18 communities of Mabalane (10 in Ntlavene post and 8 in Combumune Post) are situated in the left margin of the river are within the buffer zone[23].

Part of the district of Mabalane is included in the Limpopo National Park. This park has been developed has a concrete example of international cooperation between Mozambique, RSA and Zimbabwe in the context of the post-apartheid regime and end of the civil war in Mozambique. It was initiated 1998 with the support of an NGO (Peace Park Foundation - PPF). But political and ideological pressure to speed up the process and lobby of this NGO led to the transformation of initial project of a transfrontier conservation area of a transfrontier park[24], although Mozambique officials pushed for the former option. Donors also insisted that no forced removal would be undertake for the 27 000 people that lived in the area (mostly along rivers in particular the Limpopo and Shingwedzi rivers) and that broad consultation would be undertaken with committees in case of resettlement to discuss notably the compensation.

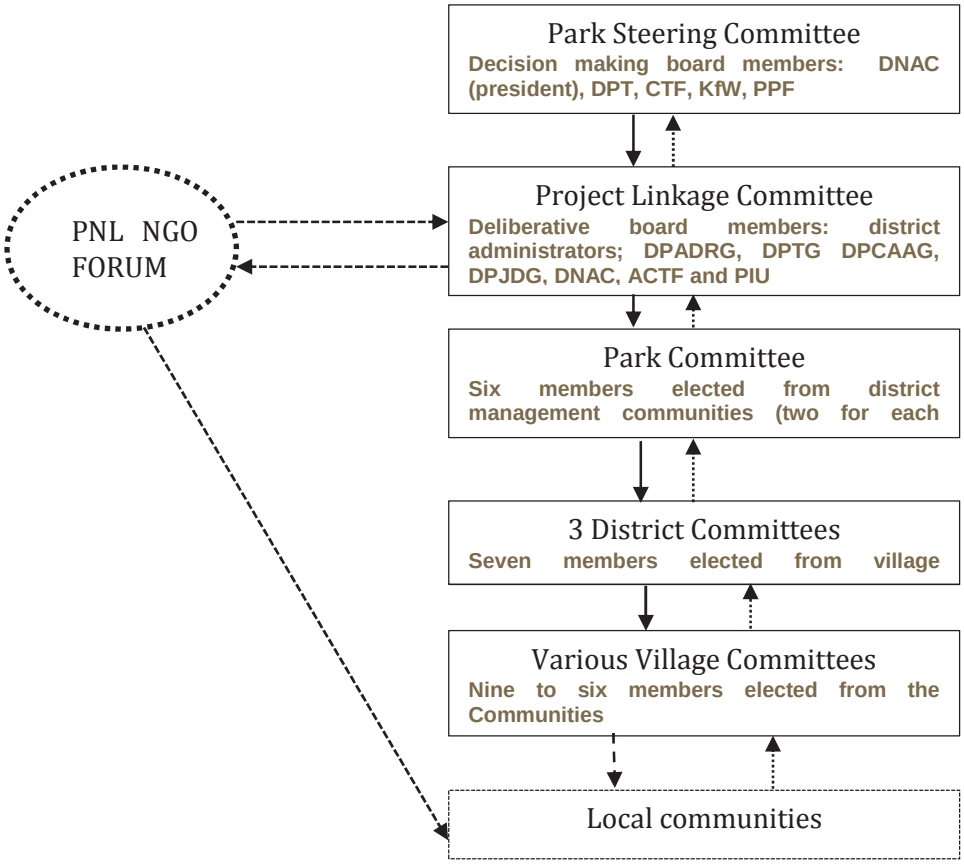
The park was officially created in 2001 on an area used by the Portuguese colonial regime as an hunting zone (or Coutada 16) (Nhancale 2007). A project Management Unit (PIU) is in charge of the management with a South African project coordinator from the PPF NGO and park warder appointed by the Mozambican government. This governance framework gives the NGO an important power in the management of the park (Spierenburg et al. 2008). Management committees were created but none of the finally institutionalized ones had the mandate to deal with community issues. The PIU is directly under the authority of the Ministry of Tourism.

Analysis of the governance of the park has underlined that local government (that is district representatives and/or traditional authorities) have in fact lost jurisdiction in the area and communities voice have been actually little heard in the park development[25] and management (Spierenburg et al. 2008)Nhancale, 2007 #997}. *"They are under-represented, under-respected, under-skilled and under-ressourced actors in this power games*" (Spierenburg, 2008). Local authorities have only been involved in later stage of the process to mobilize and inform communities. Although communities did not want to leave originally the intensified human-wildlife conflicts they are facing due to the removal of fences are leading them to be more willing for "voluntary" resettlement in other areas. (Leeuwis and Milgroom 2010).

Management committees have been established in all villages. Some members of these villages committees are participating in the district committee and two members of each district committee have been elected to constitute the park committee (made of 6 members) (Nhancale, 2007). (see next figure)

: PARK MANAGEMENT INSTITUTIONS (FROM NHANCALE, 2007)

[23] Differently to other park in the world, the buffer zone of the PNL directly lies with the limit of the park
[24] No population is supposed live in a park, while population may remain in a conservation area.
[25] Nhancale (2007) mentioned than that the park was proclaimed by the Mozambican council of Ministers the same day that a consultation workshop with stakeholder was conducted in Xai Xai and local gouvernement both at district and provincial level were not involved in the park development leading to conflict between government authorities and PIU…



DNAC:	Direção Nacional de Areas de Conservaç ão – National Directorate for Conservation Areas
DPT:	Direção de Promoção Turistico (Tourism Promotion Directorate)
ACTF:	Areas de Conservação Transfronteiriça (Transfrontier Conservation Areas)
KfW:	German Bank for Development
PPF:	Peace Park Foundation
DPADRG:	Direção Provincial de Desenvolvimento Rural de Gaza (Gaza Provincial Directorate for Rural Development)
PIU:	Project Unit

Spierenburg (2008) also report than **a NGO forum**[26] was created in order to try and secure funding to facilitate coordination and provide better services to the communities. Seven NGOs are reported as active in the areas with activities ranging to the development of infrastructure (such as school and hospitals), interpretation and dissemination of new land law, information and "education" of communities (Nhancale, 2007)

Population that is living on the margin of the Shingwedzi river in the heart of the park should be removed toward the Elefante rivers. Although this poor community did not want to leave originally the intensification human-wildlife conflict due is leading more and more people to accept the idea of moving (Leeuwis and Milgroom 2010).

The population living on the margin of the Limpopo River (or Buffer zone) is to be maintained and receives support from the Park. This support was developed through the project the project "*Programa de Apoio Comunitario*" (Community Support Program) funded by AFD (French

26 Comprising seven national NGOs (Organização Rural de Ajuda Mutua ou ORAM, Forum para Natureza em Perigo ou FNP – secretaria do Forum, União Nacional de Camponeses ou UNAC; Caridade Christã ou Caritas – Chokwe; Justiça e Paz de Xai Xai, Serviço civil pela Paz,; Reconstruindo **a Esperança (RE). Three international NGOs : African Wildlife Foundation AWF, International Union For Nature Conservation ou IUCN –Mozambique an Veterinarian Aid ou VETAID Mozambique.**

Development Agency) 2009-2012. This program was notably responsible for building of a fence to impede the incursion of elephants in the farmers' plots on a line linking downstream of the Massingir Dam to the Hassane village in Mabalane: a large triangle between the Elephant River and the Limpopo is thus reserved to the communities. The fence was completed in 2013. The project also developed of a non-tarred road that was supposed to permit access to the villages of the buffer zone all year round. Unfortunately, the main bridge of this road over the Shingwedzi river was damaged during the 2013 January flood.

The Community support program also supports the development of irrigation schemes with an objective of 30 to be developed in the buffer zone (3 districts). In Mabalane at the end of 2012, four irrigation schemes had already been created and two were being initiated. The methodology includes meeting at community level to select community that are interested and willing to invest time in the development of the scheme, selection by the technician of an area adapted for irrigation, development of the scheme and installation of the equipment, support to the association for the first year of cropping and capacity building around irrigated agriculture, development of demonstration plot. The NGO LUPA is also in charge of capacity building of the associations and their legalization.

The legal framework (Diploma Ministerial 93/2005 relative to the right of local communities on Mozambican State Tax) grants **20 % of revenues from wildlife and forest resources**[27] to local communities, the funds aiming to promote local development. In the past the government gave back the 20 % to the park which in turn gave a check to the park committee[28] that had a bank account in its name. The committee was responsible for managing the money by presenting projects for the communities. But this procedure was changed at the end 2012: From now on The Ministry of Tourism will pass money first to the Provincial Government which will in turn pass it back to the District (in the district bank account for natural resources). Yet the way this money was to be used at district level had not been clarified in 2013 and in Mabalane it was proposed that this money in turn would be added to the FDD funds but only accessible to communities of the LNP through presentation of individual project following the FDD models and procedure. There was however different interpretation of the new procedure in the Massingir district (N Giva, pers. Com)

[27] Known as the "o mecanismo de canalização dos 20%"
[28] Gathering 6 representatives of the communities of the park, 2 representatives for each of the 3 districts covered by the Park.

Análise de Variância para as variáveis quantitativas

1. **Idade do chefe** do Agregado Familiar em função do **grupo de pobreza**

Source	Partial SS	df	MS	F	Prob > F
Model	921.127483	3	307.042494	1.62	0.1897
grup	921.127483	3	307.042494	1.62	0.1897
Residual	21668.7708	114	190.076937		
Total	22589.8983	117	193.076054		

Interpretação: Não existe diferença da idade dos chefes do agregado familiar nos diferentes grupos de pobreza (p > 0.10).

1.1 Idade do chefe do Agregado Familiar em função do **local**

Source	Partial SS	df	MS	F	Prob > F
Model	437.810272	2	218.905136	1.14	0.3245
loca	437.810272	2	218.905136	1.14	0.3245
Residual	22152.088	115	192.626852		
Total	22589.8983	117	193.076054		

Interpretação: Não existe diferença da idade dos chefes do agregado familiar nos diferentes locais (p > 0.10).

2. **Tamanho da família** em função do grupo de pobreza

Source	Partial SS	df	MS	F	Prob > F
Model	568.786921	3	189.59564	10.78	0.0000
grup	568.786921	3	189.59564	10.78	0.0000
Residual	2023.06182	115	17.5918419		
Total	2591.84874	118	21.9648198		

Interpretação: Existe diferença do tamanho do agregado familiar nos diferentes grupos de pobreza (p < 0.10).

Tamanho médio da família por grupo de pobreza

Grupo de pobreza	Tamanho médio da família

1	6.8 b
2	7.4 b
3	12.1 a
4	11.3 a

Pares de médias com mesma letra não diferem entre si
com base no teste de Tukey a 10% de significância

Pelo teste de Tukey pode-se concluir que as famílias mais ricas apresentam famílias maiores em relação as famílias mais desfavorecidas.

2.1 **Tamanho da família** em função do grupo do local

Source	Partial SS	df	MS	F	Prob > F
Model	34.7086068	2	17.3543034	0.79	0.4575
loca	34.7086068	2	17.3543034	0.79	0.4575
Residual	2557.14013	116	22.0443115		
Total	2591.84874	118	21.9648198		

Interpretação: Não existe diferença do tamanho do agregado familiar nos diferentes locais (p > 0.10).

3. **Mão de obra adulta (MO adulta)** em função do grupo de pobreza

Source	Partial SS	df	MS	F	Prob > F
Model	132.840153	3	44.2800509	6.40	0.0005
grup	132.840153	3	44.2800509	6.40	0.0005
Residual	796.269091	115	6.92407905		
Total	929.109244	118	7.87380715		

Interpretação: Existe diferença da quantidade de mão de obra adulta na família nos diferentes grupos de pobreza (p < 0.10).

Mão de obra adulta por grupo de pobreza

Grupo de pobreza	Média da mão de obra adulta
1	4.2 b
2	4.4 b
3	6.5 a
4	6.5 a

Pares de médias com mesma letra não diferem entre si
com base no teste de Tukey a 10% de significância

Pelo teste de Tukey pode-se concluir que as famílias mais ricas apresentam mão de obra adulta maior em relação as famílias mais desfavorecidas.

3.1 **Mão de obra adulta (MO adulta)** em função do local

Source	Partial SS	df	MS	F	Prob > F
Model	50.5187586	2	25.2593793	3.33	0.0391
loca	50.5187586	2	25.2593793	3.33	0.0391
Residual	878.590485	116	7.57405591		
Total	929.109244	118	7.87380715		

Interpretação: Existe diferença da mão de obra adulta nos diferentes locais ($p < 0.10$).

Mão de obra por local

Locais	Média da Mão de obra
1	4.8 ab
2	5.6 a
3	3.8 b

Pares de médias com mesma letra não diferem entre si
com base no teste de Tukey a 10% de significância

Pelo teste de Tukey pode-se concluir que o loca 2 apresenta maior quantidade média de mão de obra adulta em relação ao local 3.

4. **Mão de obra familiar excluindo crianças que estudam e doentes crônicos (MO_semScol)** em função do local

Source	Partial SS	df	MS	F	Prob > F
Model	20.6320472	2	10.3160236	0.81	0.4456
loca	20.6320472	2	10.3160236	0.81	0.4456
Residual	1469.92257	116	12.6717463		
Total	1490.55462	118	12.6318188		

Interpretação: Não existe diferença da quantidade de "Mo_semScol" nos diferentes locais ($p > 0.10$).

4.1 Mão de obra familiar excluindo crianças que estudam e doentes crônicos (MO_semScol) em função do grupo de pobreza

em função do grupo de pobreza

Source	Partial SS	df	MS	F	Prob > F
Model	251.005531	3	83.6685103	7.76	0.0001
grup	251.005531	3	83.6685103	7.76	0.0001
Residual	1239.54909	115	10.7786877		
Total	1490.55462	118	12.6318188		

Interpretação: Existe diferença da quantidade de "Mo_semScol" nos diferentes grupos de pobreza ($p < 0.10$).

Tamanho médio da Mosemescol por grupo de pobreza

Grupo de pobreza	Tamanho médio da Mosemescol
1	4.2 b
2	4.7 b
3	7.5 a
4	7.5 a

Pares de médias com mesma letra não diferem entre si
com base no teste de Tukey a 10% de significância

Pelo teste de Tukey pode-se concluir que as famílias mais ricas apresentam Mosemscol maior em relação as famílias mais desfavorecidas.

1.

2. Mão de obra real (MOreal) em função do grupo de pobreza

Source	Partial SS	df	MS	F	Prob > F
Model	103.059144	3	34.3530481	5.60	0.0013
grup	103.059144	3	34.3530481	5.60	0.0013
Residual	705.529091	115	6.13503557		
Total	808.588235	118	6.85244267		

Interpretação: Existe diferença da quantidade de mão de obra real nos diferentes grupos de pobreza ($p < 0.10$).

Mão de obra real por grupo de pobreza

Grupo de pobreza	Mão de obra real média
1	3.1 b
2	3.5 b
3	5.0 a
4	5.0 a

Pares de médias com mesma letra não diferem entre si
com base no teste de Tukey a 10% de significância

Pelo teste de Tukey pode-se concluir que as famílias mais ricas apresentam mão de obra real maior em relação as famílias mais desfavorecidas.

5.1 **Mão de obra real (MOreal)** em função do local

Source	Partial SS	df	MS	F	Prob > F
Model	31.7120952	2	15.8560476	2.37	0.0982
loca	31.7120952	2	15.8560476	2.37	0.0982
Residual	776.87614	116	6.6972081		
Total	808.588235	118	6.85244267		

Interpretação: Existe diferença da quantidade de mão de obra real nos diferentes locais ($p < 0.10$).

Mão de obra real por local de pobreza

Locais	Mão de obra real média
1	3.7 ab
2	4.5 a
3	3.1 b

Pares de médias com mesma letra não diferem entre si com base no teste de Tukey a 10% de significância

Pelo teste de Tukey pode-se concluir que o local 2 apresenta maior mão de obra real em relação ao local 3.

3. **Número de crianças com menos de 15 anos de idade** em função do grupo de pobreza

Source	Partial SS	df	MS	F	Prob > F
Model	157.549824	3	52.5166081	6.84	0.0003
grup	157.549824	3	52.5166081	6.84	0.0003
Residual	883.374545	115	7.68151779		
Total	1040.92437	118	8.82139296		

Interpretação: Existe diferença do número médio de crianças com menos de 15 anos de idade nos diferentes grupos de pobreza ($p < 0.10$).

Crianças com menos de 15 anos por grupo de pobreza

Grupo de pobreza	Média de crianças < 15 anos
1	2.6 b
2	3.0 b
3	5.6 a
4	4.7 a

Pares de médias com mesma letra não diferem entre si com base no teste de Tukey a 10% de significância

Pelo teste de Tukey pode-se concluir que as famílias mais ricas apresentam maior número de crianças com menos de 15 anos de idade comparativamente as famílias mais desfavorecidas.

6.1 **Crianças < 15 anos** em função do local

Source	Partial SS	df	MS	F	Prob > F
Model	**1.98852812**	**2**	**.994264061**	**0.11**	**0.8950**
loca	**1.98852812**	**2**	**.994264061**	**0.11**	**0.8950**
Residual	**1038.93584**	**116**	**8.95634346**		
Total	**1040.92437**	**118**	**8.82139296**		

Interpretação: Não existe diferença do número médio de crianças com menos de 15 anos nos diferentes locais (p > 0.10).

7. **Número de cabeças de gado excluindo junta de bois** (**cabgad**) em função do grupo de pobreza

Source	Partial SS	df	MS	F	Prob > F
Model	**5232.49506**	**3**	**1744.16502**	**32.85**	**0.0000**
grup	**5232.49506**	**3**	**1744.16502**	**32.85**	**0.0000**
Residual	**6106.07636**	**115**	**53.0963162**		
Total	**11338.5714**	**118**	**96.0895884**		

Interpretação: Existe diferença do número médio de cabeças de gado nos diferentes grupos de pobreza (p < 0.10).

Crianças com menos de 15 anos por grupo de pobreza

Grupo de pobreza	Média de cabeças de gado
1	0.8 c
2	1.7 c
3	8.4 b
4	18.6 a

Pares de médias com mesma letra não diferem entre si com base no teste de Tukey a 10% de significância

Pelo teste de Tukey pode-se concluir que as famílias mais ricas (grupo 4) apresentam maior número de cabeças de gado comparativamente aos restantes grupos de pobreza.

a. **Número de cabeças de gado excluindo junta de bois (cabgad)** em função do grupo do local

Source	Partial SS	df	MS	F	Prob > F
Model	124.63113	2	62.315565	0.64	0.5267
loca	124.63113	2	62.315565	0.64	0.5267
Residual	11213.9403	116	96.6718991		
Total	11338.5714	118	96.0895884		

Interpretação: Não existe diferença do número médio de cabeças de gado nos diferentes locais (p > 0.10).

8. **Número de animais de pequeno porte (peq animais)** em função do grupo de pobreza

Source	Partial SS	df	MS	F	Prob > F
Model	662.881482	3	220.960494	2.06	0.1088
grup	662.881482	3	220.960494	2.06	0.1088
Residual	12310.2782	115	107.045897		
Total	12973.1597	118	109.942031		

Interpretação: Não existe diferença do número médio de animais de pequeno porte nos diferentes grupos de pobreza (p > 0.10).

8.1 **Número de animais de pequeno (peq animais)** porte em função do local

Source	Partial SS	df	MS	F	Prob > F
Model	216.703922	2	108.351961	0.99	0.3764
loca	216.703922	2	108.351961	0.99	0.3764
Residual	12756.4557	116	109.969446		
Total	12973.1597	118	109.942031		

Interpretação: Não existe diferença do número médio de animais de pequeno porte nos diferentes locais (p > 0.10).

9. **Número de galinhas e patos (Volaille)** em função dos grupos de pobreza

Source	Partial SS	df	MS	F	Prob > F
Model	141.751856	3	47.2506188	2.19	0.0926
grup	141.751856	3	47.2506188	2.19	0.0926
Residual	2477.52545	115	21.5436996		
Total	2619.27731	118	22.1972653		

Interpretação: Existe diferença do número médio de galinhas e patos nos diferentes grupos de pobreza ($p < 0.10$).

Crianças com menos de 15 anos por grupo de pobreza

Grupo de pobreza	Média de galinhas e patos
1	2.8 b
2	3.3 b
3	2.8 b
4	5.8 a

Pares de médias com mesma letra não diferem entre si com base no teste de Tukey a 10% de significância

Pelo teste de Tukey pode-se concluir que as famílias mais ricas (grupo 4) apresentam maior número de galinhas e patos comparativamente aos restantes grupos de pobreza.

9.1 Número de galinhas e patos (Volalille) em função do local

Source	Partial SS	df	MS	F	Prob > F
Model	92.8113076	2	46.4056538	2.13	0.1234
loca	92.8113076	2	46.4056538	2.13	0.1234
Residual	2526.466	116	21.7798793		
Total	2619.27731	118	22.1972653		

Interpretação: Não existe diferença do número médio de galinhas e patos nos diferentes locais ($p > 0.10$).

10. Efectivo bovino (Bovino) em função do grupo de pobreza

Source	Partial SS	df	MS	F	Prob > F
Model	6103.94875	3	2034.64958	36.43	0.0000
grup	6103.94875	3	2034.64958	36.43	0.0000
Residual	6423.21091	115	55.8540079		
Total	12527.1597	118	106.16237		

Interpretação: Existe diferença do número médio de cabeças de gado nos diferentes grupos de pobreza (p < 0.10).

Crianças com menos de 15 anos por grupo de pobreza

Grupo de pobreza	Média de cabeças de gado
1	1.0 c
2	2.8 c
3	10.3 b
4	20.6 a

Pares de médias com mesma letra não diferem entre si
com base no teste de Tukey a 10% de significância

Pelo teste de Tukey pode-se concluir que as famílias mais ricas (grupo 4) apresentam maior efectivo bovino comparativamente aos restantes grupos de pobreza.

10.1 **Efectivo bovino (Bovino)** em função do local

Source	Partial SS	df	MS	F	Prob > F
Model	128.878984	2	64.439492	0.60	0.5489
loca	128.878984	2	64.439492	0.60	0.5489
Residual	12398.2807	116	106.88173		
Total	12527.1597	118	106.16237		

Interpretação: Não existe diferença do número médio de gado bovino nos diferentes locais (p > 0.10).

11. **Superfície em hectar (sequeira)** em função do local

Source	Partial SS	df	MS	F	Prob > F
Model	2.10966507	2	1.05483254	3.50	0.0338
loca	2.10966507	2	1.05483254	3.50	0.0338
Residual	32.5950399	108	.301805925		
Total	34.7047049	110	.315497318		

Interpretação: Existe diferença da superfície em ha nos diferentes locais (p < 0.10).

Crianças com menos de 15 anos por grupo de pobreza

Locais	Superfície média (ha)
1	0.4 a
2	0.3 ab
3	0.0 b

Pares de médias com mesma letra não diferem entre si
com base no teste de Tukey a 10% de significância

Pelo teste de Tukey pode-se concluir que o local 1 apresenta maior superfície comparativamente ao local 3.

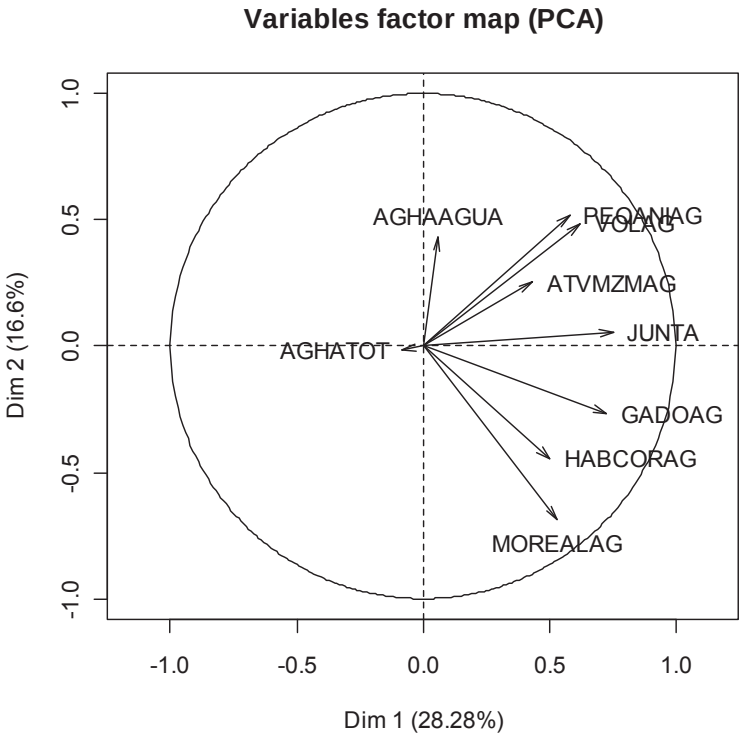
11.1 **Superfície em hectar (sequeira)** em função do grupo de pobreza

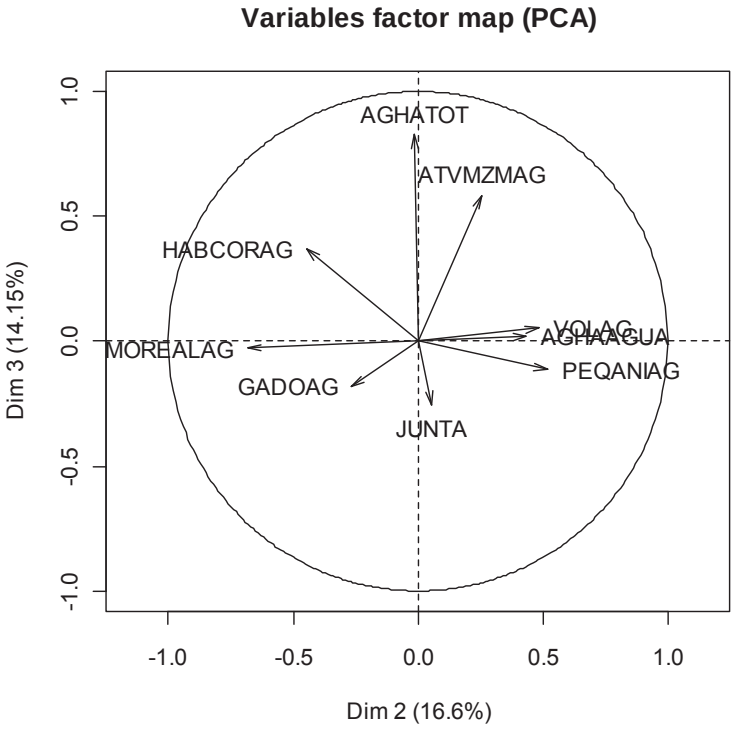
Source	Partial SS	df	MS	F	Prob > F
Model	.698355493	3	.232785164	0.73	0.5349
grup	.698355493	3	.232785164	0.73	0.5349
Residual	34.0063494	107	.31781635		
Total	34.7047049	110	.315497318		

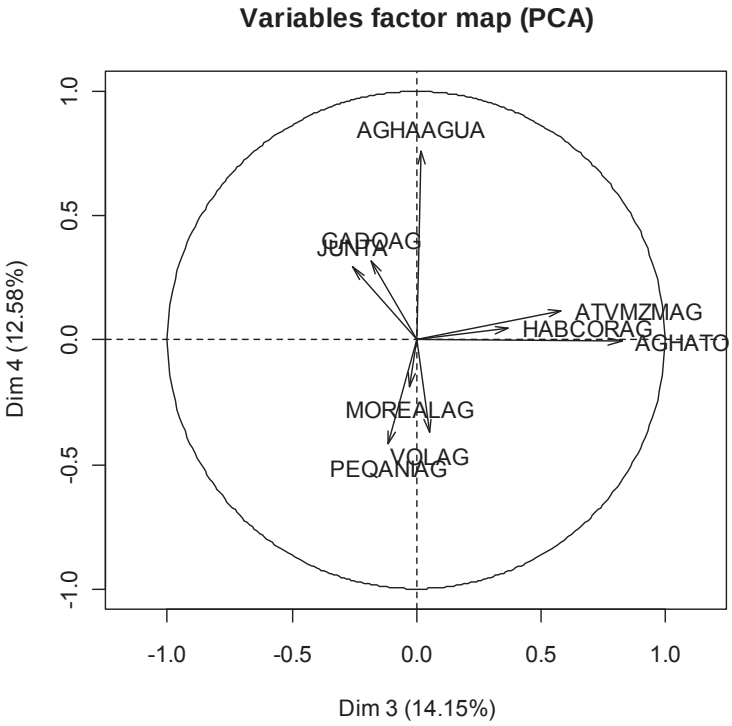
Interpretação: Não existe diferença da superfície média nos diferentes grupos de pobreza (p > 0.10).

A. PCA

Local 1.


Variables factor map (PCA)
AGHAAGUA
PEQANIAG
VOLAG
ATVMZMAG
JUNTA
AGHATOT
GADOAG
HABCORAG
MOREALAG
Dim 2 (16.6%)
Dim 1 (28.28%)
1.0
0.5
0.0
-0.5
-1.0


Variables factor map (PCA)
AGHATOT
ATVMZMAG
HABCORAG
VOLAG
AGHAAGUA
MOREALAG
PEQANIAG
GADOAG
JUNTA
Dim 3 (14.15%)
Dim 2 (16.6%)
1.0
0.5
0.0
-0.5
-1.0



Diversos autores afirmam que para aplicações em diversas áreas do conhecimento o número de componentes utilizados tem sido aquele que acumula 70% ou mais de proporção da variância total. Neste caso as 4 primeiras componentes principais explicam a variação total em cerca de 71.6%.

Contribuição das variáveis nas componentes principais

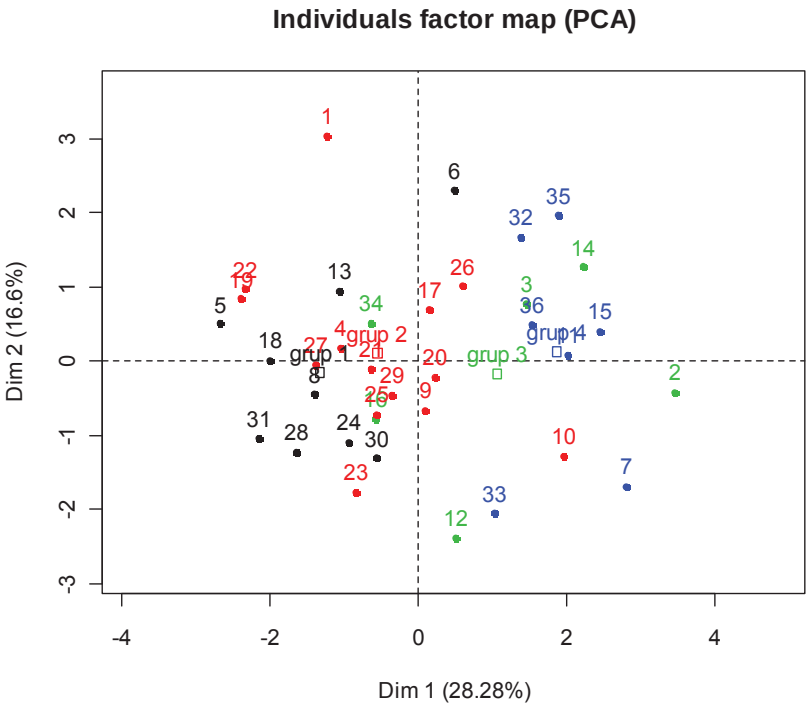
A componente principal número 1 é aquela que explica a maior variação total com aproximadamente 28 %. Portanto as variáveis que estão altamente correlacionadas com esta componente principal são aquelas que possuem maior contribuição ou peso, isto é, são aqueles que apresentam maior importância na classificação (ver tabela 1 aqueles com coloração amarela).

Tabela 1. Correlação das variáveis com as componentes principais

VARIÁVEIS	CORRELAÇÃO COM A CP	CONTRIBUIÇÃO NA CP
JUNTA	0.75	22.24
GADO AG	0.73	20.71
VOL AG	0.62	15.2
PEQANI AG	0.58	13.17
MO REAL AG	0.53	11.07
HAB SCOR AG	0.5	9.85
ATV MZM AG	0.43	7.35
AG HÁ TOTAL	-0.08	0.27
AG HÁ AGUA	0.06	0.14

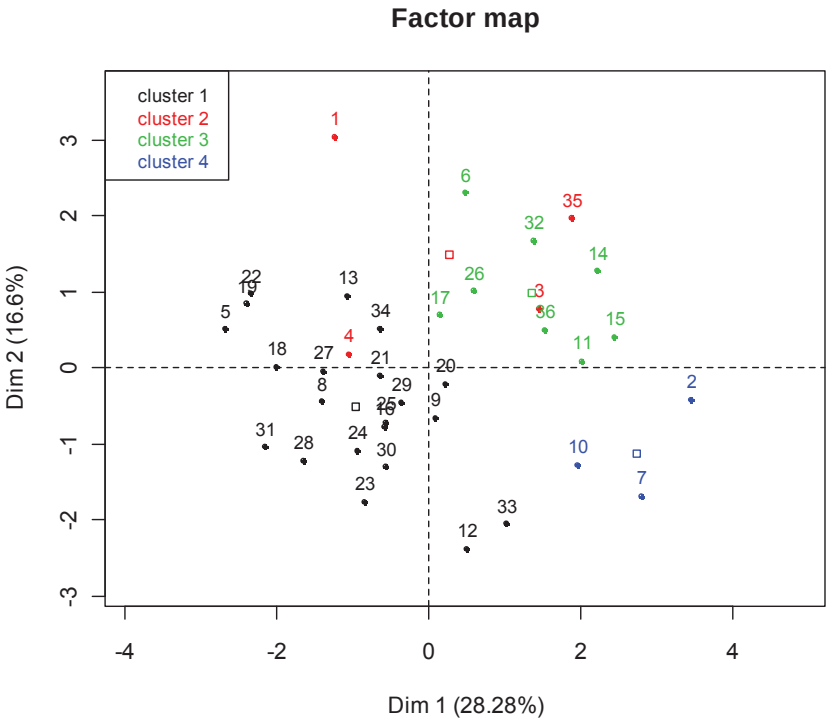
Classificação dos líderes comunitários

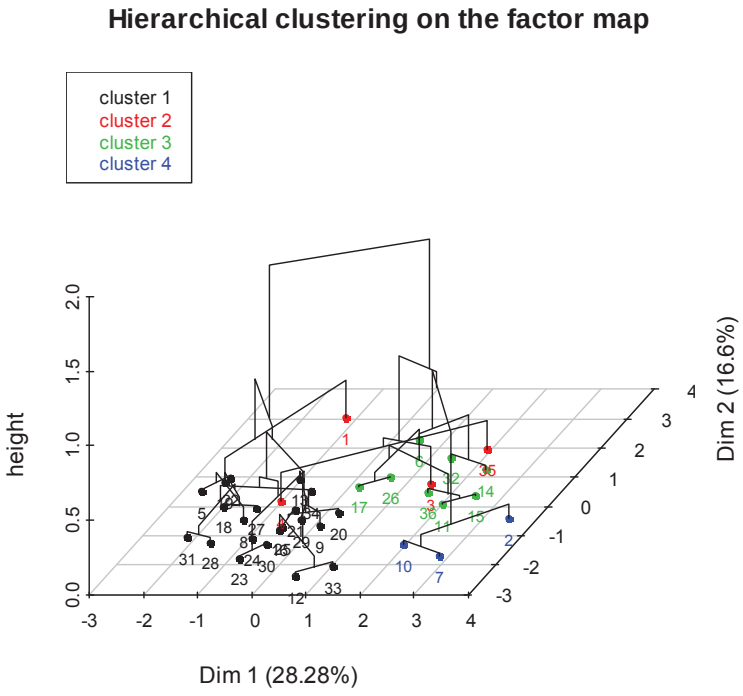
Pela análise visual pode-se ver que existe uma pequena sobreposição na classificação entre os grupos 3 e 4 e entre os grupos 2 e 3 mas também entre os grupos 1 e 2.



Classificação estatística

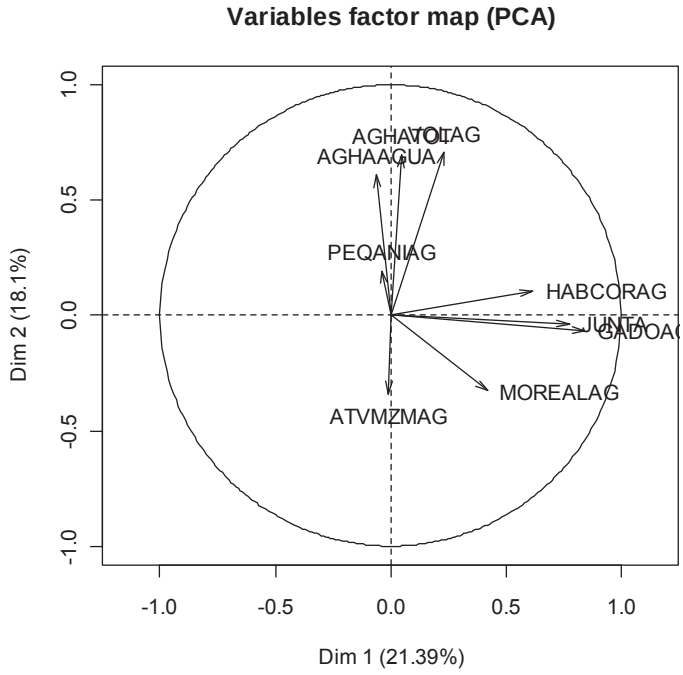
Para a seguinte análise foi feita a análise de cluster. O método de classificação usado foi o cluster hierarquico com construção do dendograma que consiste em agrupar os indivíduos segundo uma hierarquia. Na figura abaixo o cluster 1 corresponde aos Agregados Familiares mais pobres enquanto que os clusters 3 e 4 corresponde aos agregados familiares mais ricos. Ao sobrepor a classificação hierárquica aqui obtida com a figura 1 (**"variable factor map"**) pode-se ver que os agregados familiares mais ricos encontram-se no mesmo sentido do vector das variáveis que possuem maior grau de importância na classificação (ver tabela 1).

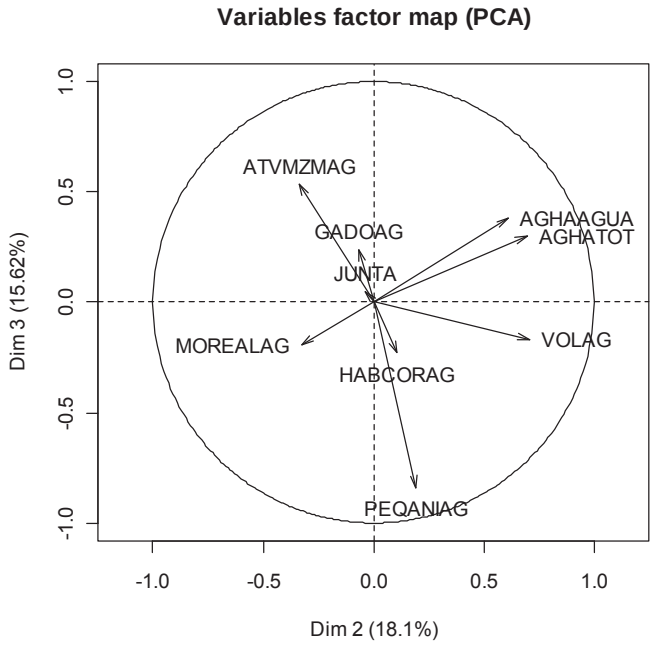


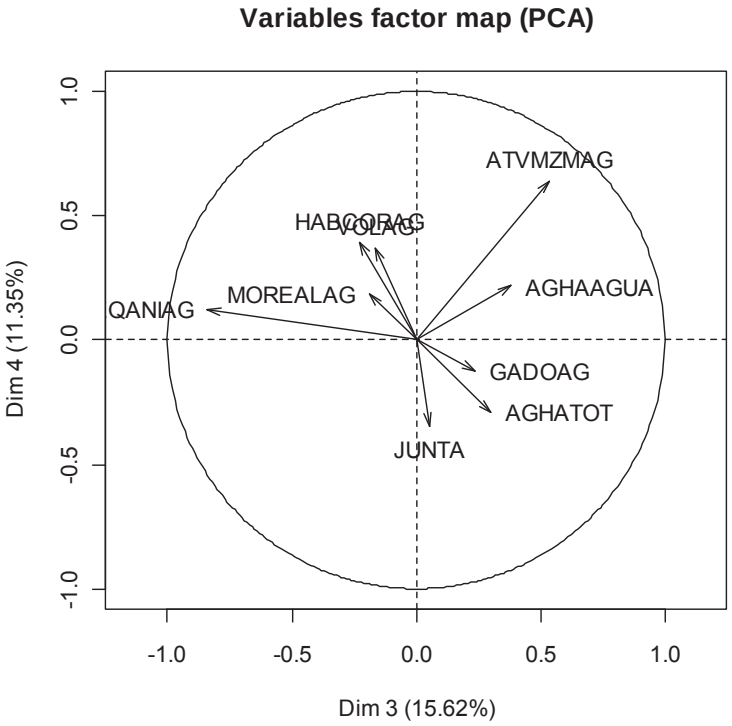


Local 2.

Ver comentários apresentados para o local 1.


Variables factor map (PCA)
AGHATOT
VOLAG
AGHAAGUA
PEQANIAG
HABCORAG
JUNTA
MOREALAG
ATVMZMAG
Dim 2 (18.1%)
Dim 1 (21.39%)
1.0
0.5
0.0
-0.5
-1.0


Variables factor map (PCA)
ATVMZMAG
GADOAG
AGHAAGUA
AGHATOT
JUNTA
MOREALAG
VOLAG
HABCORAG
PEQANIAG
Dim 3 (15.62%)
Dim 2 (18.1%)
1.0
0.5
0.0
-0.5
-1.0

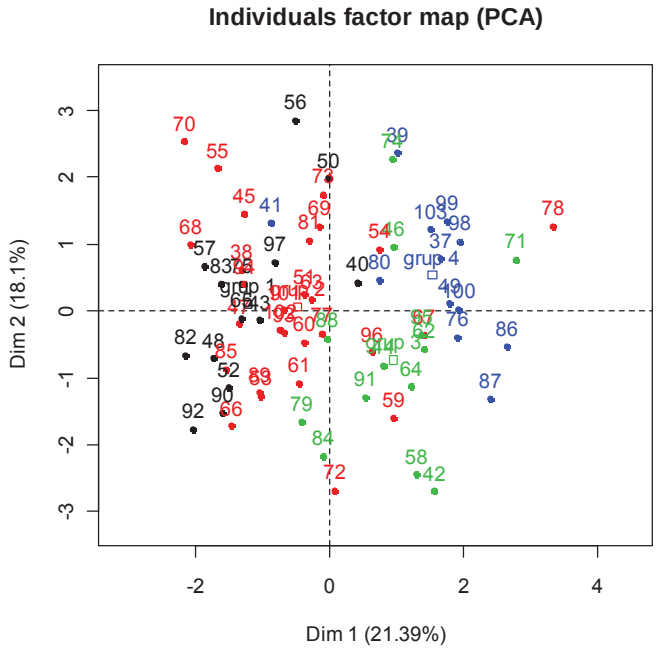


Contribuição das variáveis nas componentes principais

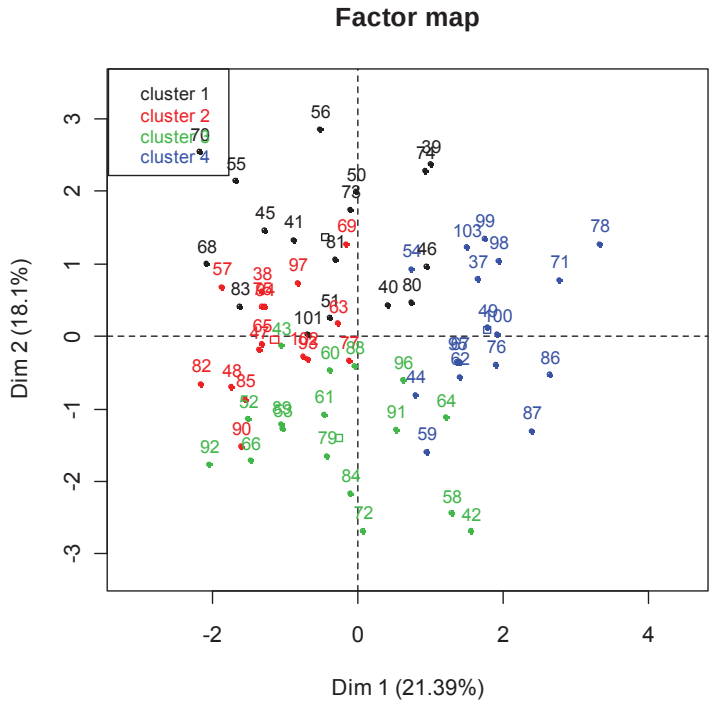
Tabela 2. Correlação das variáveis com as componentes principais

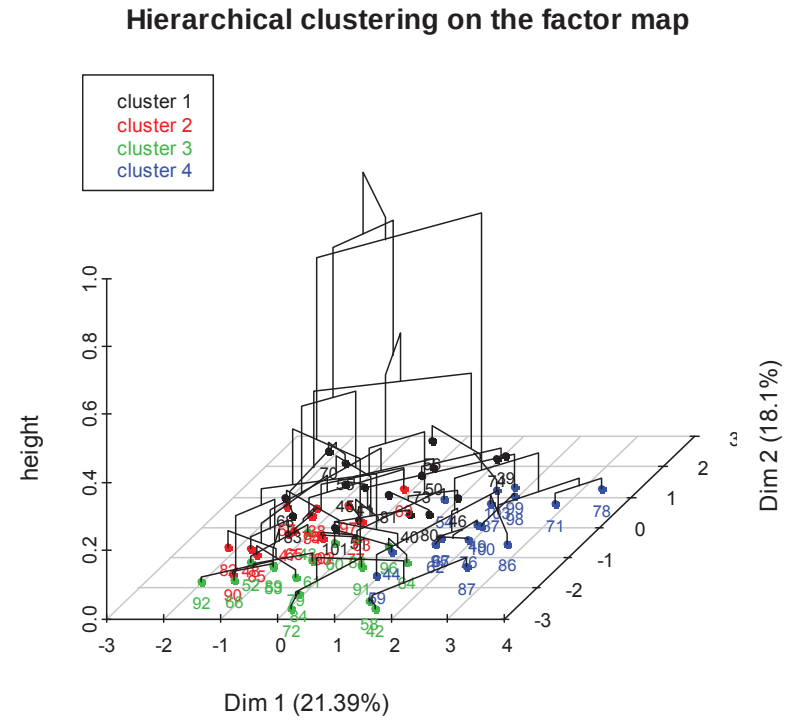
VARIÁVEIS	CORRELAÇÃO COM A CP	CONTRIBUIÇÃO NA CP
GADOAG	0.84	36.86
JUNTA	0.77	31.1
HABCORAG	0.62	19.67
MOREALAG	0.42	9.15
VOLAG	0.23	2.83
AGHAAGUA	-0.06	0.2
AGHATOT	0.05	0.12
PEQANIAG	-0.04	0.08
ATVMZMAG	-0.01	0

Classificação dos líderes comunitários

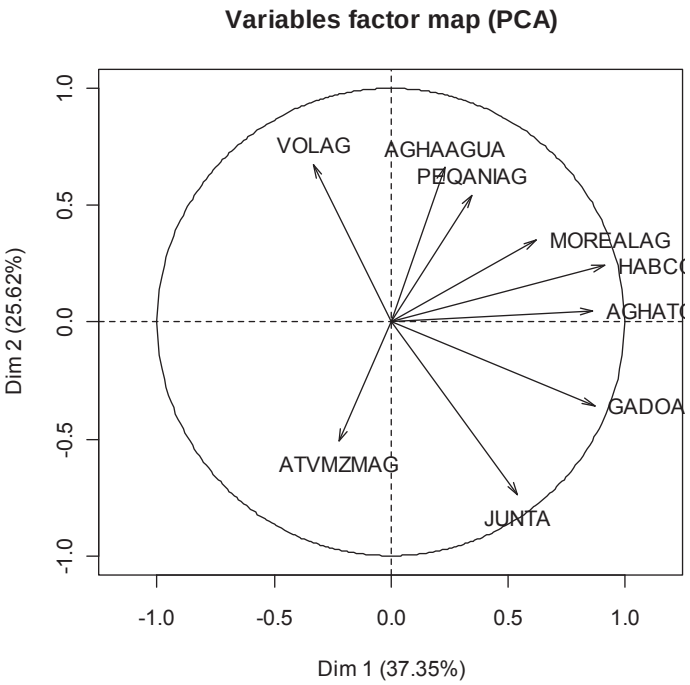


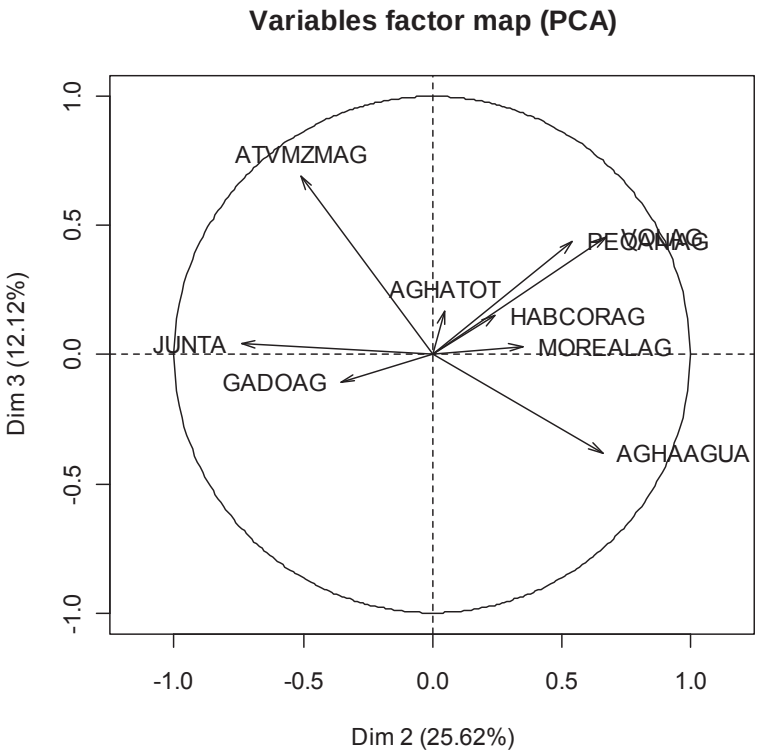
Classificação estatística




Hierarchical clustering on the factor map
cluster 1
cluster 2
cluster 3
cluster 4
height
Dim 1 (21.39%)
Dim 2 (18.1%)

Local 3


Variables factor map (PCA)
VOLAG
AGHAAGUA
PEQANIAG
MOREALAG
HABC
AGHAT
GADOA
ATVMZMAG
JUNTA
Dim 2 (25.62%)
Dim 1 (37.35%)

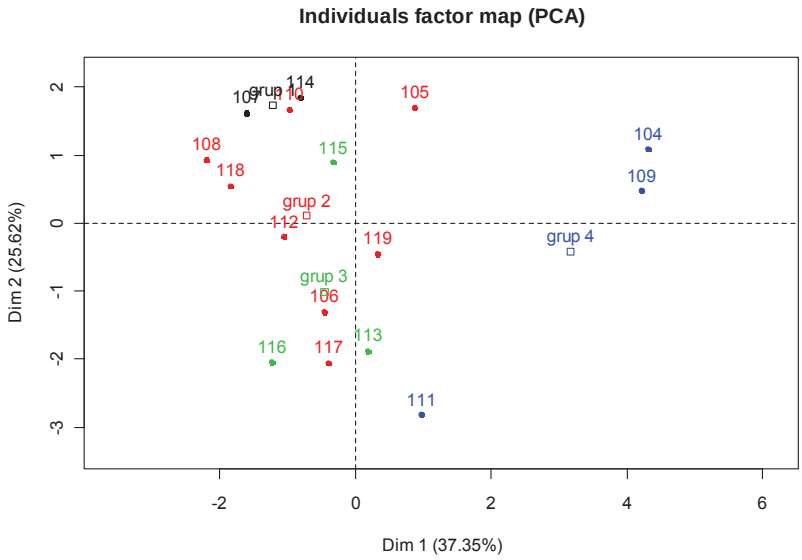


Contribuição das variáveis nas componentes principais

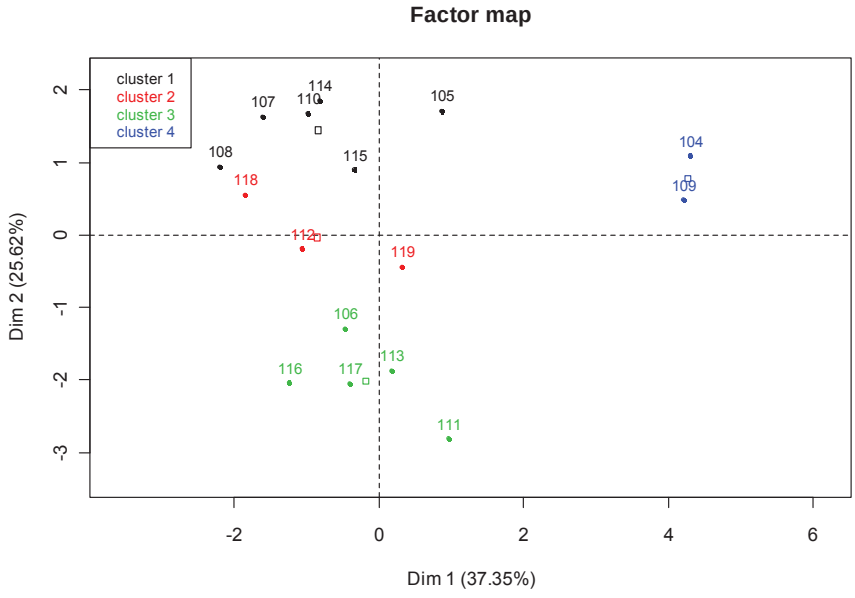
Tabela 2. Correlação das variáveis com as componentes principais

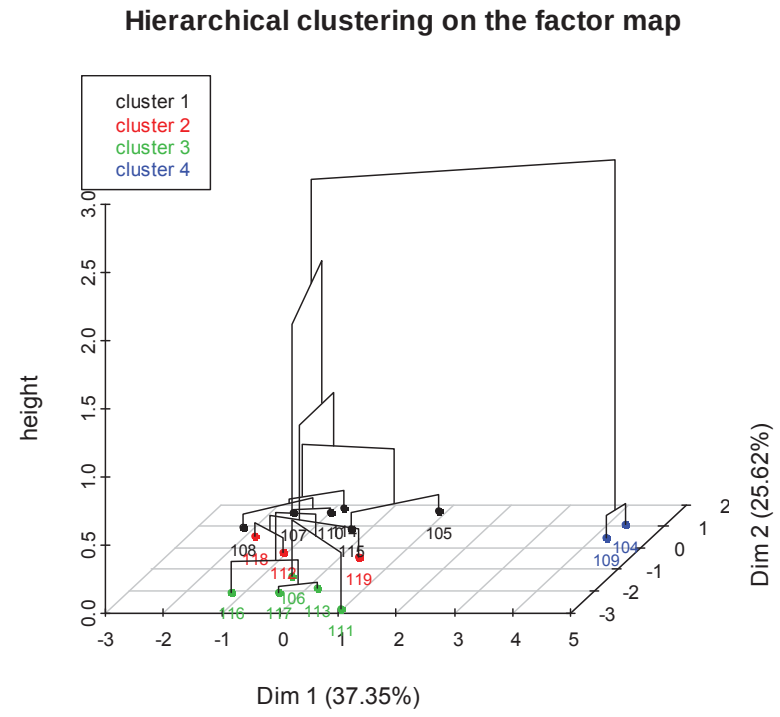
VARIÁVEIS	CORRELAÇÃO COM A CP	CONTRIBUIÇÃO NA CP
HABCORAG	0.91	24.85
GADOAG	0.87	22.68
AGHATOT	0.86	22.24
MOREALAG	0.62	11.56
JUNTA	0.54	8.74
PEQANIAG	0.35	3.6
VOLAG	-0.33	3.3
AGHAAGUA	0.23	1.55
ATVMZMAG	-0.22	1.48

Classificação dos líderes locais

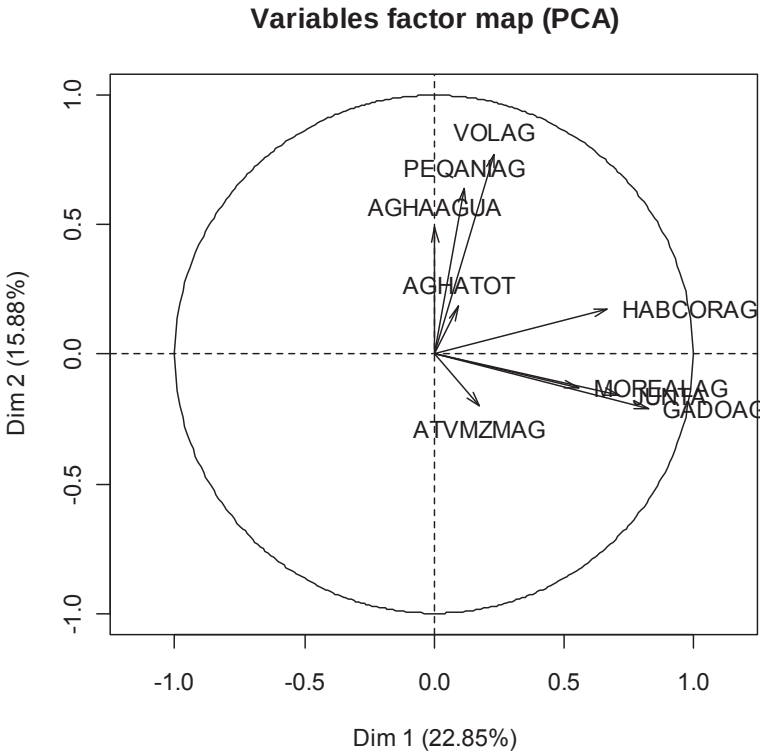


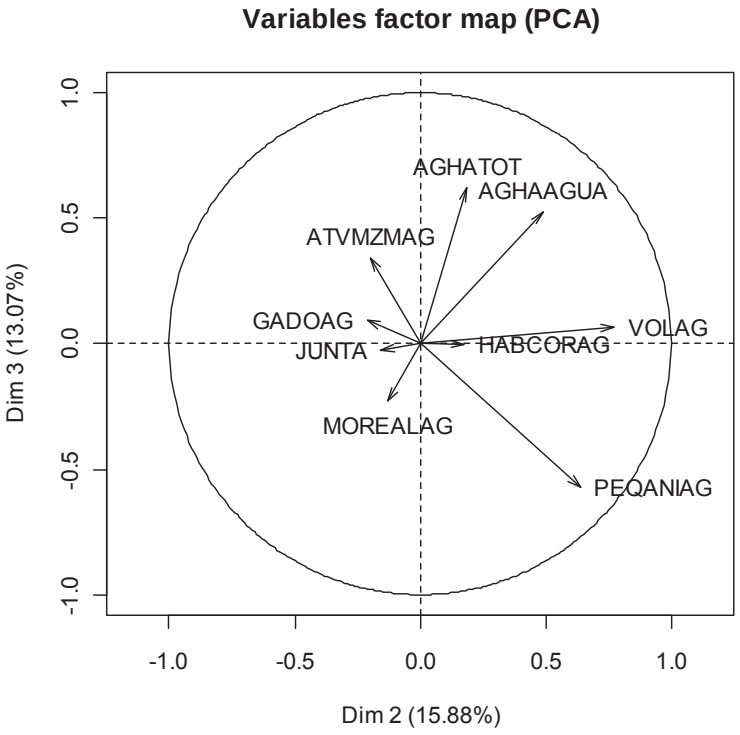
Classificação estatística

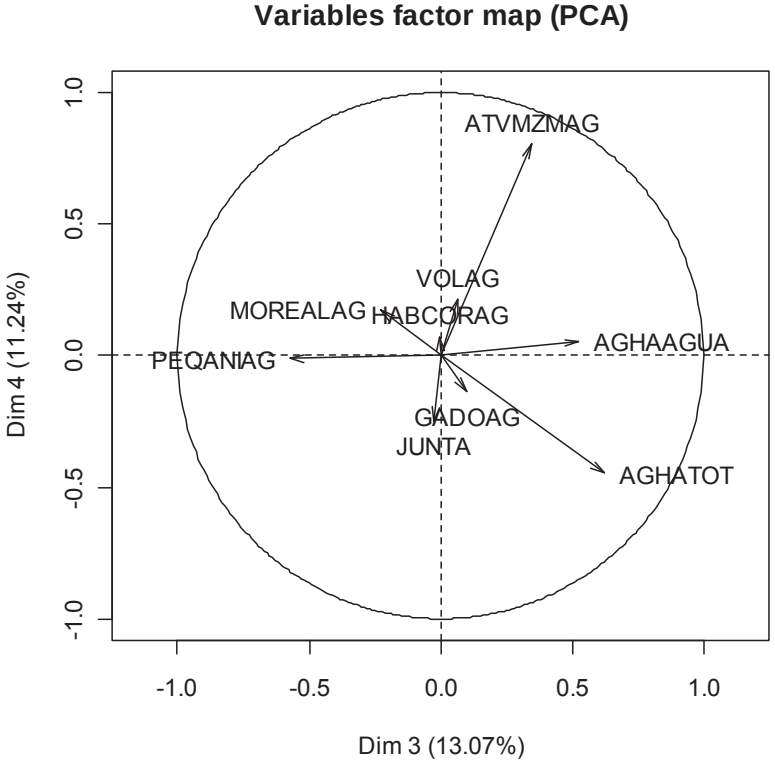



Hierarchical clustering on the factor map
cluster 1
cluster 2
cluster 3
cluster 4
height
Dim 1 (37.35%)
Dim 2 (25.62%)

GERAL


Variables factor map (PCA)
VOLAG
PEQANIAG
AGHAAGUA
AGHATOT
HABCORAG
MOREALAG
GADOAG
ATVMZMAG
Dim 1 (22.85%)
Dim 2 (15.88%)



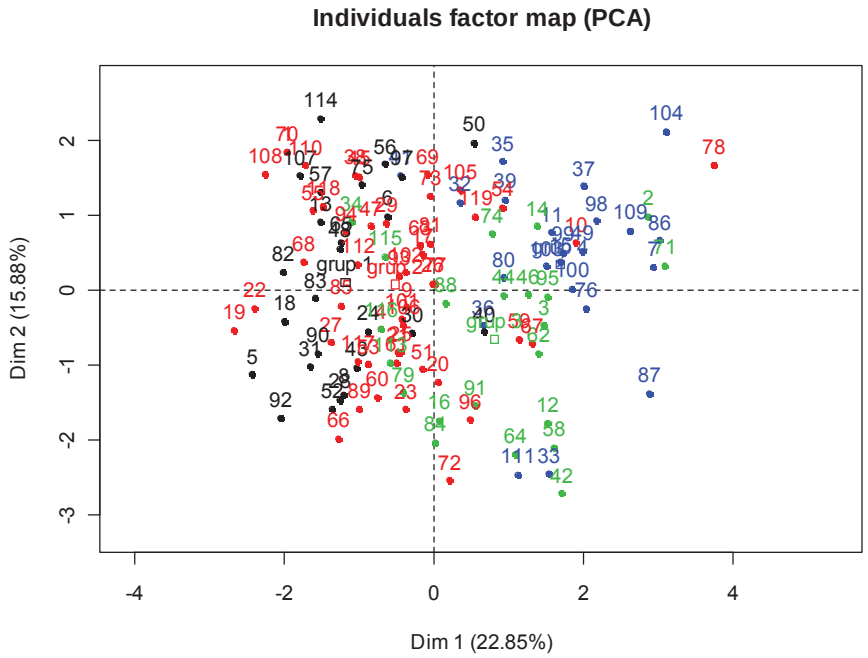


Contribuição das variáveis nas componentes principais

Tabela 2. Correlação das variáveis com as componentes principais

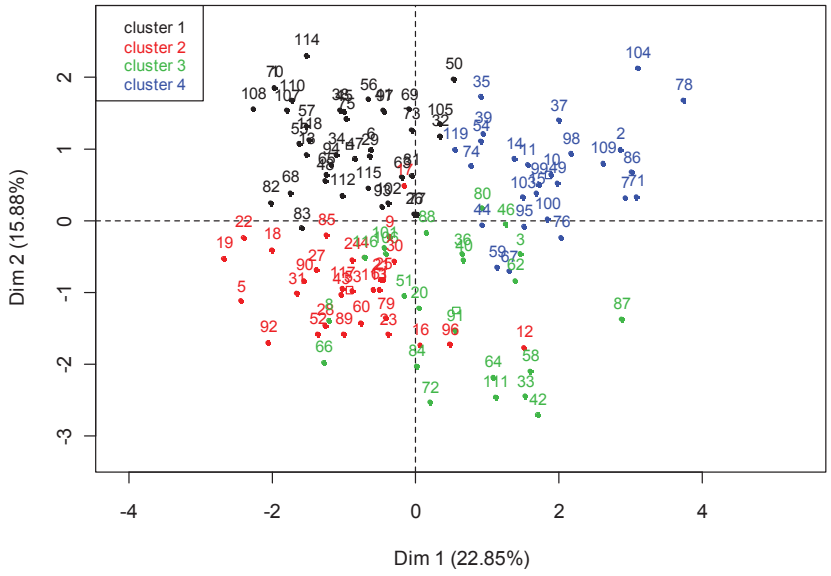
VARIÁVEIS	CORRELAÇÃO COM A CP	CONTRIBUIÇÃO NA CP
GADOAG	0.83	33.16
JUNTA	0.71	24.68
HABCORAG	0.67	21.8
MOREALAG	0.56	15.14
VOLAG	0.23	2.65
ATVMZMAG	0.17	1.46
PEQANIAG	0.12	0.66
AGHATOT	0.1	0.45
AGHAAGUA	0	0

Classificação dos líderes comunitários

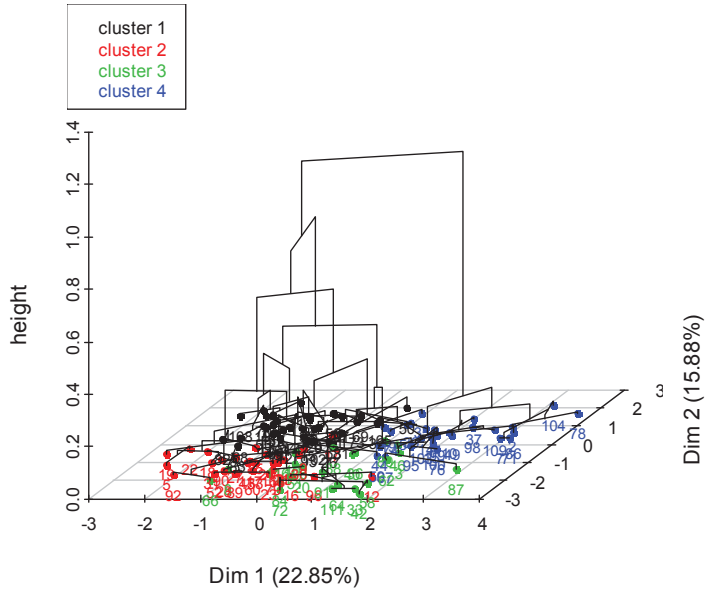


Classificação estatística

Factor map



Hierarchical clustering on the factor map



ANNEX 9: BOREHOLE MAINTENANCE: A SOCIAL ISSUE RATHER THAN A TECHNICAL ONE

In the partial[29] census of water sources done by initiated by FAEF in 2012, 12 out of the 36 water points were nonoperational (33 %) and 31 % in the official statistic of the district.

In all water point users are expected to pay a water fee, most of the time a monthly taxes although at some point payment by containers or cattle head exist.

Most of the time, when boreholes are not operational it is because maintenance operation had required a complementary funding collection. In the social context of the communities, such collect can legitimate if organized by the village leaders (2nd scale leader) and not by water committee. It thus depends of the capacity of the leader to mobilize the community. Difficulties of mobilization were repeatedly reported in two cases: (i) the community do not think it is worth paying for repairing the water points because the quality of water is poor and there are alternative source of reasonable quality at walking distance.) (ii) the management and/or implementation model of the water point created important tension[30] within the community and between the community and the sponsor – up to the point of vandalism sometimes. Although this has not been directly mentioned it is possible that when the leadership is being contested the ability to mobilize the community is weakened. However water being a rare resource in the district communities are able to overcome their difference to contribute to the reparation when it is necessary.

Indeed an organized spare supply chain at district level can help reduce both the price and the length of breakdown. Yet the difficulty of getting access to spare is more a symptom than the cause of failure to repair water points, the cause being the ability of the community to mobilize to collect extra-money for the reparation. What is at stake is the added value of a specific water points to the community and the social and political relationships between the community and their leaderships and/or the development of trust relationship with sponsors that can be mobilized for help.

In some cases the price of the spare or reparation is out of reach of the community[31]. In this case leaders link up with either to administration or external sponsors to find solutions. The difficulty is then the delay between the diagnostic and the repair which can be very long. Following PRONASAR recommendation to find a maintenance model concerning large repairs that is any intervention on the borehole itself[32] (by opposition to repair on the manual pump) or installation of a new pump, SDPI is currently considering officially integrating these reparation within its tasks. The financial model has yet to be clarified.

Rather than the way money is being collected and saved, good accounting transparency at village levels can enhance the ability of leaders to mobilize communities. The mechanisms used have not been precisely investigated but many elements points out for deficient or limited

[29] The census has not yet been done in the left margin of the river and in some remote plateau village, notably in Combumune administrative post.
[30] Apart of the case of village C presented in Box 2, two other examples where conflict involving different community groups and the sponsor resulted in a failure to maintain equipment but they have not been properly investigated.
[31] Amount to be properly assessed
[32] Verification of the state of borehole, measuring its depth or water level, cleaning or deepening the borehole, test of handpump

transparency at least from Committee/leadership to villagers and from external interventions (administration/NGOs) to villagers. Developing transparency and better communication between the different village authorities implies a medium term support to water committee based on organizational aspects and management.

At last the NGOs and administration have until now made little use of the competencies of local technicians. The PNL technician for example was not aware of the mechanical competencies available in the area. Reinforcing the role of these local mechanics as planned by PRONASAR can have indeed have a positive impact. Not only should their technical capacity be enhanced but also their but also their commitment and trust relationships with communities extended. A contractual relationship as planned by PRONASAR is a starting point as far as all actors including villages' leaders are aware of the engagement of all part within the contract. The organization of regular training of communities' members for routine maintenance operations would also contribute to strengthen the links with communities while maintaining a pool of competence at village level, guaranty quality of basic maintenance operation and strengthen the maintenance network to ensure short delay of reparation at a minimal cost for the administration.

ANNEX 10: CENSUS OF CONFLICTS AND COOPERATIVE EVENTS RELATED TO WATER IN MABALANE

TYPE OF WATER RELATED EVENTS OF CONFLICTS RELATED TO WATER

Nature of events	Social group involved	Nature of tension/cooperation	Origin of information	Development
Noncompliance of contract concerning water infrastructure	District or district service versus contractor	Delay in the development of Mabalane-Sede small water system	Reported in the media	Involvement of the national level government (prime minister); Establishment of a local commission to monitor the development of the infrastructure. Lack of funding limited the activity of this monitoring commission. The water system is still non operational
		Delay and inability of the first contractor to drill the number of boreholes as stated in the PRONASAR contract	Interview	Revocation of the contract by the Provincial government and selection of another contractor (Chinese).
		Non-compliance to the contract norms in the building of a reservoir –although all payment was made	Interview reported but at justice level (Provincial level)	Justice procedure
Disagreement over types of infrastructure to be build	Local leaders/ services representatives/local administration	Disagreement over the type of water infrastructure adapted to local situation	Interview	As part of PRONASAR program implementation. Local leaders and civil society representatives complained on the infrastructure built (borehole with a depth over 100 m and Afridev pumps which requires the mobilization of 3 to 4 women to be operated) to the local administration. The issue was mentioned in local council. The SDPI services wrote a letter to Provincial level to request adaptation of the PRONASAR project so that other types of infrastructure than boreholes can be possible (end of 2012) In another case, FUNAE had projected to equip one of the water points of a solar system to create a small water system. But the water point is saline, and the local leaders have stopped the development of the project that was assessed as not adapted as villagers have little use of this saline water, would be reluctant to pay for the maintenance of poor quality water point.

Nature of events	Social group involved	Nature of tension/cooperation	Origin of information	Development
Frustration over the refusal to build infrastructure due to quality of water resources	Local leaders, villagers, services representatives, local administration and contractors	Disagreement around the localization of boreholes - Boreholes sites identified by contractors (non-saline water) were recused by communities or by administration either because too risky (to close to river and subject to inundation), too away, on private land or on a road, creating tensions between these actors Contractor has not been able to identify non saline sites for boreholes drilling within PRONASAR contract. These created frustration and tension at community level. Different cases were reported - Water was detected in some site but it was assessed as saline. - Water was not detected at all Local leaders complained that - The contractor came without warning and did not necessarily prospect in the sites identified by the village - It did not necessarily prospect 3 sites. - Discussion with the contractor was not easy as they often come without warning and did not speak Changane	Interview, mentioned in different villages	Not all village leaders complained openly, only a few did share their frustration with local administration. SDPI received 4 official complaints (written down) The complaints varies from villages to villages (number of sites prospected, possibility of discussion etc). In some cases village leaders complained to local administration and stated their frustration of not having water. In some cases local administration and services representatives pressured the contractors to go back to prospect in other sites. Local service also decided to request the possibility to develop other infrastructure than boreholes. In the village that refused to proceed on the site proposed by the contractor, the contractor when came back did not connect with the village leader when they came back.

Nature events	Social group involved	Nature of tension/cooperation	Origin of information	Development
Conflict related with development of infrastructure with external support	Local leaders villagers and NGO representative	Lack of transparency concerning the management of funds collected by village and managed by the NGO	interview	See **Erreur ! Source du renvoi introuvable.**
	Leaders and administration	In the urban village, users are complaining against the water tariffs	interview	Water tariffs of the water system is this urban center is higher than the other urban center which are at the moment both managed by the railway. Residents are complaining against difference (60 MZM/month instead of 25MZM/month)
	Between villagers/local leaders and local leaders connected to NGO	Transparency of management and leadership conflicts	Interview (2 places)	Distrust over the management of money collected for maintenance of water infrastructure (moto-pumps and small water system). In the two cases reported, it was linked to lack of transparency between leaders and villagers in their dealing with an outsider support leading to internal leadership conflict. A challenger generally used the issue of fund management to challenge the authority of the leadership leading to vandalism and/or retraction from villagers from the scheme. Tensions were exacerbated by the way NGO or external support (government in one case) initiated and developed the process of infrastructure development.
Conflict between villagers over same or different water uses	Between cattle owners and plot owner at village level Cattle owner may be resident of the village or outsider	Destruction of crops when cattle get to the river or reservoirs for drinking	Mentioned in nearly all villages. In 2 villages the conflict seems particularly acute	In all villages fencing the plots crop close to the river is necessary. Normally, plot owner is allowed to collect the cattle that wander in his plot and the cattle owner may be asked to pay a fine to the plot owner to get his cattle back. But in some case, when cattle owner are well connected to village leaderships or administration /party system at district level, these rules cannot be enforced. This can lead people to stop irrigating (mentioned in one village)
	Between water users/women in case of water scarcity	When the water yield is slow either because overconsumption or poor infrastructure maintenance, conflicts arise between women over queuing and volume collected	Interviews (3 places)	The general rule at all boreholes is that the women have to follow the queue (line of containers). When yield of water is limited, the number of containers per person can be limited by the local leaders but there still might be confusion. This kind of conflict is if possible solved at water committee level but they generally do not have the necessary legitimacy/aithority to do it and problem as being brought to village leaders.
	Between leaders and villagers	Access to new boreholes is closed until a proper fences has been done	interview	Leaders claim that the only possibility to mobilize the community for the fencing of new boreholes (or cleaning of old one) is to close the access (with a key) until the work is being done, which create tension inside the village especially where there are no other non-saline borehole as users are willing to use the new water as soon as possible
	Between villagers and outsiders	Restriction to a reservoir providing water access to a Plateau village	interview	Charcoal workers which are motorized are asked to fetch water at the river

ANNEX 11: CARDS FOR EQUITY EXERCISE 1 (VOUCHERS DISTRIBUTION IN AN EMERGENCY SITUATION)

D

240 MT

250

Famílias

Todos recebem salvo aqueles com mais recursos

B

600 MT

100

Famílias

Apenas um terço das familias recebem vouchers

C

1200 MT

50

Famílias

Apenas os mais vulneraveis recebem vouchers

A

200 MT

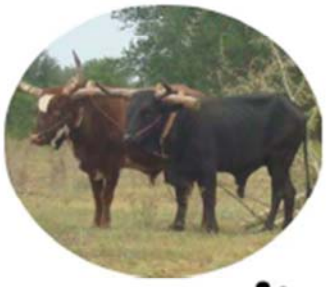
300

Famílias

A aldeia toda recebe vouchers

ANNEX 12: CARDS FOR EQUITY EXERCISE 2 (VILLAGE LEVEL DEVELOPMENT OPTIONS)

M *Par de bois + charrua*



2

N *Trabalho para comida*

30

O *Subsidio mensal para família carente*

5

P *Feira agricola insumos subsidiados*

100

Q *Demo tecnicas melhoradas ag. Seq.*

1

R *Demo Latrinas melhoradas*

2

S *Carvão quantidade limitada*

T *Carvão sem limite*

ANNEX 13: LAND GOUVERNANCE IN MOZAMBIQUE

As other countries of the Limpopo Basin, Mozambique is characterized by the existence of a dual system of customary and statutory land tenure.

The Land Policy (1995) and the Land Law (19/97) confirms that all land in Mozambique is State property. The land law protects the citizens' rights (against notably more commercial enterprise) by allowing obtaining a right to use and exploit the land (DUAT – Direito de Uso e aproveitamento da Terra). Land use rights may be acquired through 3 main mechanisms 1) occupation according to customary norms and practices 2) good faith occupation of land previously used by other for a minimum time occupation (10 years) with no contestation or claim by other 3) through the formal request to the state by investors. The constitution confers locally a real sense of security (Nhancale 2007).

DUAT can be attributed to an individual or to a community – provided the land is being efficiently used according to normal practices and not against the constitution (Manjate 2010). The Mabalane district for example has already emitted 29 DUAT's (PEDD Mabalane 2008)

Local community and administration plays a central role in the Land law: Community can be given long term land use rights and use right to resources connected to the land including water. But this land use right has to be formalized through a process of community delimitation or land demarcation, a complex and expensive process that can face various bureaucratic delay.

Private investors usually use the statutory system to get access to land: Provincial government can grants titles to areas from 0-1000 ha, the Ministry of Agriculture to areas of 1000 to 10000 ha and the council of Ministries to areas above 10000 ha. Communities are supposed to be consulted prior to approving a concession and title as well as participate to resolution of land and resources conflicts with private interest (Tique 2002). Private sector must register the holding, acquire a title and pay a land tax. The title guarantees security of tenure.

Most of the time smallholders and communities relies on customary tenure regimes (Tique 2002)) At household level and in a context of general shortage of labour power in the peasant sectot, the capacity to use the land is one of the key determinants of landholding. Locally land are inherited or distributed by the chief, notably low-land: those who have better relationships with the traditional authority in charge of land distribution are thus favored notably by getting access to better land that is land with water access (Osbahr et al. 2008; Tique 2002). In the family sector and community security of tenure is guarantee by occupation, community membership and may be strengthening by planting trees. With the local leaders' knowledge foreigners from the community can acquire the right to use community land.

Land access can also be related to particular arrangement between families. Manjate and Magaia (2010) mentioned for example that surface cultivated by large farmer tend to increase during the rice season which suppose some form of arrangement between farmers (Manjate et al. 2010). Tique (2002) reports possibility of borrowing and the existence of land market within community or between community and foreigner. Within community the sellers are often young people wanting money to move to urban area or South Africa and buyer older people. Arrangement between communities and private investors are also possible. The private investor is often asked to provide some kind of compensation for echange of the piece of land which is often based **in kind for example in equipment**. Conflict emerged when the private investor for example do not comply

with its promise. Tique underlines that one of the question is who represent the communities un the land negotiation and trasactin and raises the issue of the legitimacy of the leaders involved in the discussion (see part) .

ANNEX 14: MOBILIZATION AND INCORPORATION OF PROPOOR POLICIES IN WATER MANAGEMENT AT BASIN LEVEL IN MOZAMBIQUE BY ELKE PRAAGMAN, MSC WAGENINGEN UNIVERSITY

For my thesis research on the political arenas of water management at different policy levels in the Limpopo Basin, Mozambique, I have been investigating how stakeholder participation in water management has been implemented and adopted at different policy levels. I have made a distinction between national, regional, basin and local level. I have focussed mainly on the interactions between basin and local level.

In the Limpopo Basin, the official stakeholder platform, the *Comité de Bacía do Limpopo* (CBL), has been set-up to enhance stakeholder participation. To start at this level, the main problem that the CBL is facing that the representation of stakeholders in the platform does not reflect the actual situation. The basin management unit of ARA-SUL, UGBL, elects the members of the CBL. The statutes of the CBL indicate the committee should have 13 members. In November 2012 there were only 12 members. These are represented in table 1. Beside the members, there is a number of stakeholders that are invited to the meeting. The representation of the stakeholders is problematic because smallholder farmers in the Limpopo Basin have only been identified partly. Therefore UGBL has no clear insight in the number of water users in the basin.

This process of identifying water users for stakeholder participation goes hand in hand with the process of registering water users for water payments. However, the objectives of the water authority to register and license water users is being complicated by the law on common use of water. At the time of the research between September and December 2012, UGBL was constructing a cadaster of water users. This registration focussed on the water users that required licensing, therefore common water users were not being registered. Common uses of water therefore have become even more invisible for policy makers and implementers. For the representation of water users in the CBL, this means that 'smallholder farmers' are only the ones that require licensing, i.e. water user associations or private farmers that own their own pump and irrigate an area larger than 1 ha. In practice, most farming activity up to 3 ha is not being registered[33]. Identification of water users is done via 'focal points', water users that often hold a high socio-economic or political function at district level. These focal points help UGBL to identify water users and are used to collect water fees of licensed smallholder farmers or farming associations.

Then if we return to stakeholder participation in water management, the focal points have no role in transmitting information from UGBL to the water users they collect fees from. As the director of UGBL mentioned: "*Focal points are only for the collection of fees*." Topics that are discussed in the CBL are supposed to "*reach the users directly"*, through the district administration that is. But that already indicates a one-way communication, from the CBL to the users. And, because common uses of water are not being identified, this information only reaches a part of the target group. Focal points are not attributed any value concerning stakeholder participation in this sense. Then, if we take communication channels one level down, to the local level, all communication between the district government and communities occurs through the community leader. This leader has been elected by the community, but holds a powerful position in negotiations since he is the gatekeeper

[33] Folha cadastro UGBL, September 2012

for the rest of the community. All community leaders I have interviewed during my field work were not aware of a stakeholder platform for water management.

Then, if the stakeholder platform should not only function as information dispenser, but is also an advisory body for the director of UGBL, there should be a two-way communication from the CBL to the users and back. But if at local level water users are not aware that this platform exists, their participation in the decision-making process is non-existent.

I have focussed on two cases in the Limpopo Basin, the decision-making process around the water and land concession to MAI in Massingir district, and the functioning of the parastatal RBL-EP concerning water and land allocation in the Baixo Limpopo irrigation scheme.

In the case of MAI, a presentation was held at the CBL meeting at November 2nd 2012 on different water intake options for the concession. The objective of the presentation was to convince other water users that a direct intake from the reservoir lake of Massingir would not negatively affect downstream water users. Striking in this case however, is that the water concession itself did not seem point of discussion. The size of the water concession will have considerable effects on downstream users, and thus it should be discussed in the CBL. The decision on the water concession however, is taken one level up, by ARA-Sul. As one of the staff members of MAI commented after the meeting in November 2012, "*this meeting has no influence on the decision of the water concession, that decision will be made on a higher level. But it is important for future developments to gain support from other water users in the basin".*

The other case study on the functioning of RBL-EP showed that when RBL-EP was set-up, it covered an area of 12,000 ha, which was the original perimeter of the ancient irrigation scheme of Baixo Limpopo (RBL). When a bilateral agreement between China and Mozambique was being made at national level on the allocation of land for rice cultivation, RBL-EP, which responds directly to the Ministry of Agriculture, was instructed to allocate an area of 20,000 ha in total to the Chinese irrigated rice project Wanbao Ltd. Since Mozambican Law prescribed that all land and water are property of the state, RBL-EP was granted great authority over the irrigation scheme by MINAG through the DPA. A community consult has not taken place, and land allocation as well as water allocation has not been done through communitarian consult or stakeholder consult. Communities in the valley of Baixo Limpopo were given the option to be incorporated into the project of Wanbao or to be relocated outside the project. The water concession to Wanbao remains unclear, though they are registered in the cadastre of UGBL for 6,000 ha (Chicumbane block). The Chinese, as well as other companies and smallholder water users within the perimeter of RBL-EP are represented in the CBL by RBL-EP, but none of the users in the scheme are aware of what is being discussed in the meetings, or are not aware of the existence of this stakeholder platform at all.

Concluding from those two cases, stakeholder participation misses the target of including all water users in decision-making. Common water users as well as smallholder farmers or associations in remote areas are not being identified or are not yet identified in a time where important decisions are being made concerning the water resource. The introduction of water pricing is only focussing on reimbursing costs, whereas the principle of creating awareness that water is a finite resource and a participatory approach is needed is not incorporated in this principle of the economic value of water. As soon as interests at a higher political level need to be served, stakeholder participation can easily be omitted (Chinese in RBL-EP as well as MAI). Communication between different levels on water related issues is practically non-existent. Therefore at local level, water users are not aware what is at stake.

Table 1 - Representation of members of the CBL, according to the statutes and actual representation at the CBL meeting of November 2nd of 2012.

Nr	Statutes	Actual
1	Director of UGBL	Director of UGBL (chairman of CBL)
1	Representative of the Provincial government	Representative of the Provincial Directorate of Public Works and Housing (DPOPH)
1	Representative of the Ministry of Coordination of Environmental Affairs (MICOA)	Representative of the Provincial Directorate of Environment (DPC Ambiental)
1	Representative of Provincial Services of Rural Extension (SPER)	Representative of the Provincial Directorate of Agriculture (DPA)
2	Representatives of irrigation associations	Director of Associação de Desenvolvimento de Communidades Rurais (ADCR) *Director of* Mocfer Industries Alimentaires (Mia), *Chokwe*
2	Representatives of private farmers	Farmer from Chokwe (Mr. A. Taelane)
2	Representatives of agricultural enterprises	Empresa Capelas Mohambe, Chibuto
2	Representatives of *management entities of irrigation perimeters*	RBL-EP HICEP
1	Representative of industries	-
	-	Parque Nacional do Limpopo (PNL)